

COAL AGE

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How Many Must Live On a Mine Worker's Wage?

JETT LAUCK, the consulting economist, figures five must live on a mine worker's wage. But is that true? There is good reason to believe that it is unusual. The Insurance Department of Pennsylvania and the Coal Mine Section of the Pennsylvania Compensating Rating and Inspection Bureau have produced a review of experience in the last five years since compensation went into effect in Pennsylvania. It is termed a "Statistical Analysis of Coal Mining Accidents in Pennsylvania." In Table XL we learn that in the anthracite region 406 men were killed and they had 1,008 dependents, or 2.48 dependents to each breadwinner. We also find that in the bituminous region there were 3,083 dependents for 1,388 men killed, or 2.22 dependents to each employee.

Excluding posthumous children, 2,643 children of all ages had to be supported. From this it may be learned that the average number of dependent children for each mine worker is 1.47, and the average number of adult dependents is 0.72, making 2.19 dependents actually in being, or 2.28 dependents in all.

The Coal Industry's Best Customer

HAVING a bucket full of water, how are you to put more water in that bucket? Having a business that throughout the depression of recent months has been operating practically at capacity—a business that normally finds a large outlet for its product in general industry—what may we expect to be the immediate future of that business with demands from industry getting back on its books?

This appears to represent the position of one of the best customers of the steam-coal producer: the public utility and central station. The business of manufacturing power has made great strides in recent years. During the war one industrial after another changed over from the isolated power plant to central-station power. The war industries were run on purchased electricity.

Summer demands for power are the lightest, yet the low point in 1920, in May, was represented by an average output of around 105,000,000 kw.-hr. compared with 95,000,000 in May and July, 1921, the low months in a year of intense depression. From the middle of 1921, the demand for electric power steadily mounted from around 95,000,000 kw.-hr. per day to around 102,000,000 during November and December of that year and January of the present year. In the corresponding period of the previous year the trend was in the other direction.

The inference is plain: as the industrial demand for power comes back the central stations are going to have difficulty meeting it without plant extensions. Approximately two-thirds of the power is developed from fuel; mainly coal. The utilities, the most consistent buyers and

consumers of steam coal throughout the depression, will be better customers as the year proceeds. Two general lines of policy for the directing heads in the coal industry are suggested: Make coal sufficiently attractive to the power producer that he will not turn even further to hydro-electric development and, most important, get into the power business before the power business goes further into the coal business.

So Necessary to Lower Price

GOVERNMENT regulation to lower prices of coal usually is excused by its advocates on the ground that coal is such a staff of life that its cost must be kept down. That was done in America by a combination of coal interests in the early part of the war, by governmental regulation later and by Great Britain by both regulation and subsidies.

Strange indeed it is that one government gives up its collected taxes to keep down the price of coal while another makes coal pay a tax. Both cannot be right. Coal should be taxed like chewing gum, soda fountains and movie tickets, or it should go untaxed like wheat or flour, or it should be subsidized; but all three cannot be right. If it does not matter how much coal costs we may conceivably tax it without violence to reason. If, however, we hold it is vital that it be cheap, why single it out for taxation? Pennsylvania is trying to put a tax on anthracite, and Kentucky would put it on bituminous.

The Dauphin County Court of Pennsylvania has decided that anthracite can be taxed, one of the reasons given being that anthracite can be taxed and bituminous coal be allowed to escape because anthracite is not like bituminous in that it won't make coke. But that is the irony of it all. Coke is pushing anthracite against the wall, is competing with anthracite, and the hard-coal people want help rather than hindrance in meeting this new competitor.

Telephones and Safety

READING the article on the fire in the Sunnyside mine, published in this issue, the first impression is to ask why telephones were not installed. They would have saved that three-mile run to the mine mouth to summon help, and the fire would have been more easily extinguished. The mine would have been working the following morning, and all the expense would have been saved.

However, it should be said that telephones were installed at the Sunnyside mine, which is an unusually well equipped plant and, what is more, they were used, but, not being able to reach the superintendent or foreman by telephonic means, the shotfirer who had discovered the fire made no attempt to get in touch with anyone else and started on his long trip, leaving the fire behind him.

Fighting Fire

IN A recent article by J. J. Walsh, written for *Coal Age*, on the fighting of shallow mine fires, no mention is made of silting as a means of their extinguishment. In this issue we brief some of H. J. Rahilly's remarks on the use of silt as a means of coping with mine fires, and though perhaps culm might only add fuel to the flames the use of fine sands or even clays and shales might serve the desired purpose.

Fine sands, we are told, is apt to make quicksands. This is true if time and opportunity are not given to the sand to settle. After all, the more fluid the sand the more likely it is that it will reach all parts of the flooded area. Clays are apt not to free themselves of the water by means of which they are conveyed and thus they do not form solid silting, but if the purpose is merely to fill the mined areas to the exclusion of air they may well serve the purpose desired.

By use of many churn drillholes as well as by openings through the bulkheads sealing the areas and even diamond drillholes through the surrounding walls, sufficient sand or clay could be washed in to extinguish almost any fire. An attempt to fill the mine with incombustible gas might well be futile because the flow of this gas could not be regulated to meet the needs of the places on fire. It would escape to the surface as the gases evolved by the burning coal are now doing and the cooling effect would be slight. A quantity of silt, on the other hand, would lower the temperature immediately, cause a steam pressure that would expel the air from all connected passages, and, being sent to place through many boreholes, would not fail to reach every part of the burning area. It also would assist in making it feasible to save all the coal in second mining.

Shale and culm have been found preferable material for silting live workings. They might not be so exceptionally advantageous in the filling of fire areas. In bituminous regions the shale has some value as a combustible and when dry might carry fire. In the anthracite regions the shales are barren of oil, at least all that is volatile in the natural oils has been driven off. The culm, however, has much carbon in it. For this reason shales might be used for fire silting, though culm is not so well suited to that purpose.

The matter is worth the trying, for whatever is done in the way of silting can do no harm, except perhaps in some very shallow fires, where possibly an outburst of steam or an explosion of water gas might result.

Recrudescence of a Rosicrucian

HOW fortunate for the United States that on the eve of a suspension of coal mining Herr Prückner, a chemist of Munich, has announced his discovery of a method of making coal from common rocks! The *New York Times* published a news story bearing the Berlin date line of March 6 conveying this important news to a waiting world. We must urge our Patent Office to early action, for it is stated that the Herr Doktor—he is a medical student, it seems—is “naturally reticent about the matter until his discovery has been fully protected legally in all countries, for the new coal, it is asserted, can be made by a comparatively simple process almost anywhere in the world.”

“As science knows,” he told a correspondent, “stones with some coal content are to be found in our moun-

tains in vast quantities. I studied these stones and finally chose two sorts with about 30 per cent of coal ingredient and set to work to see if I could increase the percentage of coal in them. I pulverized quantities of them and added certain chemicals to the powder. I applied heat in various degrees and allowed the mass to cool by certain stages.

“Soon I saw that the percentage of coal in the baked mass had perceptibly increased. The coal was present in the midst of a gray or gray-yellow coating.

“Later I found that for the reduction of the coating a certain chemical admixture was very effective, and then I discovered that the addition of another powdered mineral caused the crust almost to disappear. At that stage the finished mass contained 56 per cent of coal.

“It was when I was obtaining a product with that percentage of coal content that I made a surprising discovery. It was that at a certain stage of the process the coal ingredient rapidly increased from 56 to 72 per cent. Since then the percentage of coal has been increased until now I can say that what I produce is coal of excellent quality.

“Its production is technically simple. The minerals required are everywhere plentiful, and the cost of production is surprisingly low. I have worked it out at 25 marks a hundredweight—that is, for coal with the heating power of anthracite.”

This is now a nation of amateur alchemists. Home-brew apparatus should readily lend itself to the making of coal from cobblestones by a process so simple as that described—or has it been described as yet? The cabled dispatch to the *Times*—how thoughtful not to trust so important a message to the slowness of the mails—says that the correspondent who was privileged to visit the laboratory and view the samples of synthetic coal, found that they were actually black, in fact a deep black. The new coal also is an improvement over our crude variety in that the gas it gives off has no “obnoxious smell.”

What hope has the miners' union in a strike, when soon every man can have his own coal supply?



CORRECTION.—The map of the coal fields in the supplement to *Coal Age*, March 16, showed the Pennsylvania anthracite fields in solid black, the symbol reserved for non-union and open-shop districts. This was an error. Everyone knows the anthracite region is unionized.

Cut out the map above and paste over the corresponding portion of the original.

Apparatus Men Load Out Heated Material from a Mine Fire in a Cooling Current of Oxygen-Depleted Air*

Over Fifty Apparatus Men Work Six Months Reopening Sunnyside Mine, Utah—Water from Hose Cools Rock Inefficiently and Makes Too Much Steam—Air of Low Oxygen Percentage Is Used in Its place

BY C. A. ALLEN† AND A. C. WATTS‡

IN THE No. 3 Sunnyside mine of the Utah Fuel Co. a disastrous fire started in the afternoon of Aug. 17, 1920, the effects of which are still present in the mine. The operation, which is located in Carbon County, Utah, normally produces about 1,300 tons of coal a day. Two seams of coking coal lie on a pitch of about 5 deg.; the lower seam, in which the fire occurred, is 10 to 12 ft. thick and is overlaid with 3 to 7 ft. of shaly sandstone, above which is another seam 5 to 5½ ft. thick. The mine is non-gaseous, and the active workings consist of a drift about 8,000 ft. long which intersects (approximately half way down) a slope a mile long.

The workings on the slope above the point where the haulage drift intersects it are called the raise workings, and those below dip workings. Entries are driven off the slope on the strike of the coal, and the mine is operated by straight room-and-pillar methods. It is ventilated with a suction fan and, in addition to the opening where the fan is located, there were intake openings at two points, one north of the fan at the

main haulage portal and the other near the extreme south end of the mine. Practically speaking, no workings in the upper seam were reached by the fire, although it spread to the upper coal where that seam was exposed by caving.

In reopening the mine after the first seal was broken between fifty and sixty apparatus men, working three shifts daily, were constantly employed for more than six months, from Sept. 28, 1920, until April 9, 1921.

It required twenty-four days for these crews to advance the fresh air to the seat of the fire, and this part of the work called for the construction of forty-six doors and stoppings, in many of which it was necessary to do much shoveling in order to get into the solid material.

In all, more than 10,507 periods of apparatus work were performed, in which were used 13,533 regenerator cans and approximately 210,000 cu.ft. of oxygen. (A period under apparatus consisted of four hours, the men actually working about two hours on an average.)

In the course of the recovery of the mine 3,835 ft. of slope and entry were cleaned out, from which more than eight thousand 60-cu.ft. cars of caved coal and rock were removed. Approximately 5,500 cars were loaded out by men working with apparatus.

The largest cave may be estimated as 30 ft. high and

*Reprint of abstract of report of fire in No. 3 Sunnyside mine of Utah Fuel Co., published under title "Fighting a Mine Fire with Its Own Gases," in Reports of Investigations, Bureau of Mines, February, 1922.

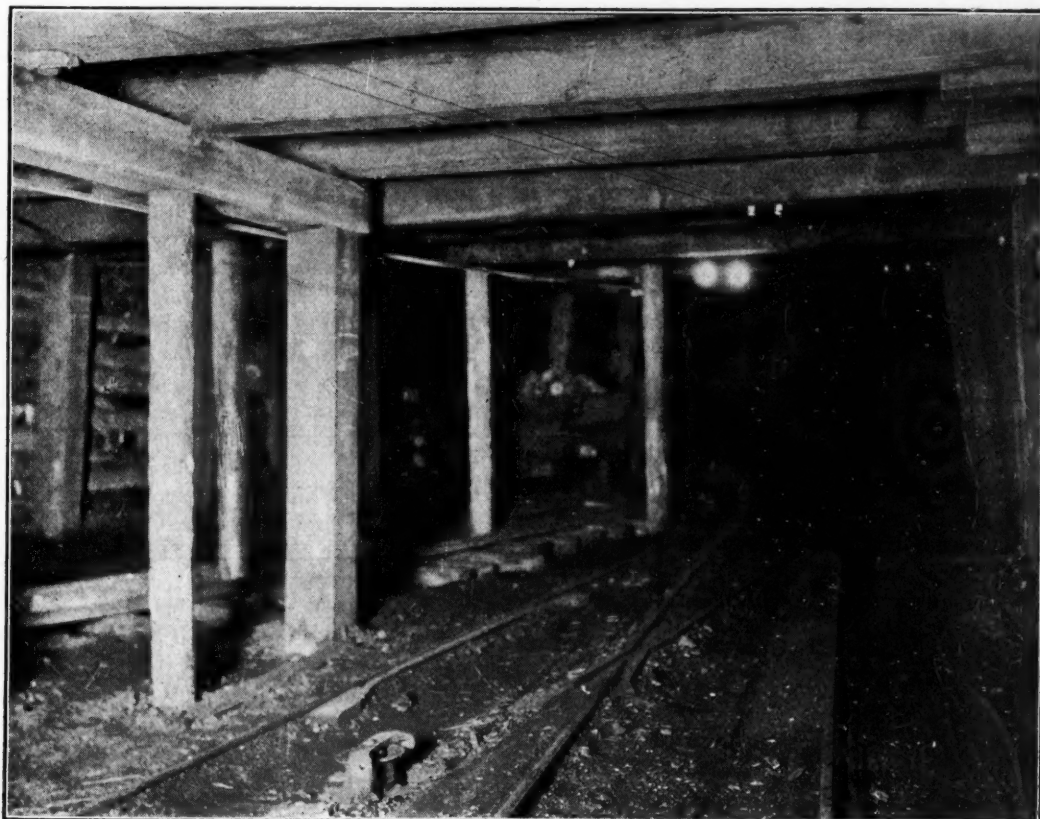
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‡Chief engineer and geologist, Utah Fuel Co.

FIG. 1

Timber in Big Cave

Timber sets had to be erected to support the roof above the main fall, which was 30 ft. wide and 30 ft. high. Not only was this timber erected by the apparatus men but the fall was removed by the same men working in an oxygen-depleted atmosphere. This cut fully illustrates the heavy work that can be done by men cumbered by breathing equipment in an atmosphere by no means cool. They worked in all 10,507 periods. The Anaconda Copper Mining Co. last year charged its apparatus no less than 22,854 times, probably a record for such work.



30 ft. wide, but this statement would overlook the fact that the cave extended into the entry, which branched off at this point, making the fall much larger. In cleaning out this fall forty cars of material had to be removed for each foot of advance.

The most remote point reached by the fire was more than 1,500 ft. from the point of origin. Despite the difficulties to be met not a single apparatus man was killed in the recovery of the mine, the most serious accident being the loss of a left arm. More than 600 gas samples were taken and analyzed at the mine in an Orsat apparatus and, in addition, many were sent to the Pittsburgh laboratories of the U. S. Bureau of Mines for analysis.

FINDS TIMBER CRIB AND TOP COAL ON FIRE

The mine is wired so that all shots may be fired by electricity from the surface, and at about 5:15 p.m. on the afternoon of Aug. 17, when the shotfirer reached the main slope and the first left main entry in his rounds to close the room switches, he discovered a fire which was burning a timber crib and also the top coal. The parting of the first left entry leaves the slope at the point where the main haulageway intersects it, and it was customary for the men to gather there while waiting for the man trip. The shotfirer discovered the fire about forty-five minutes after the trip had left, and the assumption is that either a miner's carbide lamp was left burning against a timber or (and this is a more probable supposition) that an electrical short-circuit started the fire. Throughout the mine 500-volt direct current was used.

After locating the fire and making ineffectual attempts to extinguish it, the shotfirer went to the tippie, a distance of nearly three miles, to get help. In the meantime the fire short-circuited the power wires, so that the superintendent and foreman had to walk in, arriving just before seven o'clock.

When the mine officials reached the fire the draft was causing it to travel rapidly up the main slope, also into the first left entry and up the back slope. They short-circuited the ventilation, but this caused the smoke to roll in all directions and forced them to restore the air current, but in a much reduced volume. The fire was then fought with hose for approximately thirty-six hours, when explosions, caused from the products of combustion, made it necessary to abandon these efforts.

EXPLOSIONS COMPEL THE SEALING OF THE MINE

A brattice cloth had been placed to keep the smoke from eddying around onto the men who were holding the hose, and the first tendency of the gases to explode was indicated by the action against this brattice cloth. This gave warning of the heavier flares or explosions which followed. In consequence the men were withdrawn in time to avoid serious consequences. When the efforts to fight the fire with the hose were given up, the mine was sealed at the portals. This required six seals at three different locations, and they were not completed until Friday night, Aug. 20, during which time the air, of course, had free access to the fire.

The seals at the mine portals confined almost 540 acres of workings, in which, it was estimated, there were almost one hundred million cubic feet of air. It was decided to keep the mine sealed until all active combustion and flames were subdued and until the

mine air had become so depleted in oxygen that explosions would be impossible.

While the mine was sealed daily samples of the mine air were taken from the stoppings, and three weeks after sealing was completed, the monoxide had been so reduced in percentage that it could not be detected by Orsat apparatus. The oxygen content also had been reduced to about 5 per cent. The oxygen content continued to diminish until on Sept. 28, 1920, or thirty-nine days after sealing, the first seal, which was near the fan opening, was broken in the reopening of the mine.

On Sept. 28 the gas in this part of the mine was found to analyze as in Table I.

TABLE I. ANALYSIS IN NO. 24 ROOM 200 FT. FROM THE OUTSIDE

Bottle No.	CO ₂ Per Cent	O ₂ Per Cent	CO Per Cent	CH ₄ Per Cent	N. Per Cent	Temperature
258	4.65	0.66	0.05	0.89	93.85	59°
259	4.69	0.67	0.06	0.89	93.59	

These are among the lowest oxygen percentages found during the entire fire. The depletion of oxygen was supposedly due in part to its absorption by the coal as well as to its combustion by the fire. The gas was perfectly clear, and the almost entire absence of carbon monoxide was an advantage. The distance from this point to the fire was approximately 4,000 ft., and a large force of apparatus men advanced the fresh air in stages of 400 to 800 ft. The main body of the gas was sealed off by stoppings as the work proceeded, and on Oct. 21 the fresh air had been advanced to the seat of the fire, being kept away from it, however, by a strong, tight bulkhead.

CONFINED GAS HAS HEAVY BREATHING ACTION

When samples were being taken through the seals and also when the fresh air was being advanced into the gas-filled mine the expansion and contraction, or so-called "breathing action," of the confined gas (depleted air) was marked. It was sometimes impossible to get good samples through the seals when the pressure was inward, due to the gas being contracted, and when the fresh air was being advanced, although double doors were always used, it would sometimes be possible to carry a flame safety lamp several hundred feet inside of the fresh-air base.

Also, when the pressure was outward, due to the gas body expanding, it would be impossible to take a safety lamp up to the doors. This "breathing" was, of course, due to the changes in barometric pressure, and it was found that normally there are four times during the day when the barometer changes. It usually rises in this district from one o'clock in the morning until ten o'clock, then falls until five or six o'clock in the afternoon, then rises again until some time before midnight; then there is a short period of falling barometer until about one o'clock in the morning.

When the barometer is rising the fresh air will go in and when it is falling the gas will come out. However, frequently the periodic or atmospheric fluctuations in the barometer overcome the normal daily fluctuations, so that the change may come at any period of the day. The most marked normal change comes about ten or eleven o'clock in the morning. Before that time the pressure is inward and thereafter it is outward. This was the most constant feature and the one least liable to be changed by periodic fluctuations. The maximum change in barometer observed over a long period was equivalent to about 9 in. of water gage,

whereas daily changes equivalent to 2 in. or more of water gage were not uncommon.

The difference between the temperature of the gas and that of fresh air also has some effect on the movement of the gas. When cold air enters through any leaks in the stoppings or through the doors at a fresh-air base and comes in contact with warm gas, the latter is cooled and contracts, which augments the effect of rising barometric pressure and further increases the tendency of the fresh air to be drawn in.

For this reason it was found practically impossible to approach within several hundred feet of the hot caves without raising the percentage of oxygen in the gas or depleted air surrounding them. In fact, in this case explorations to the point of origin of the fire, when the fresh-air base was 1,600 ft. away, disclosed the fact that the hot caved material was absolutely dormant and surrounded by gas containing 2.41 per cent oxygen, 3.86 per cent carbon dioxide, no monoxide, and 0.66 per cent methane.

By the time the fresh-air base had been advanced to within 400 ft. of the hot material, however, the oxygen content in the gas surrounding it had increased sufficiently to make the hot coal give off much smoke, and on one occasion enough fresh air passed through the double doors to the hot material to cause a blaze. The entrance of the fresh air past the double or air-lock doors was due almost entirely to the daily contractions of the confined body of gas or depleted air, but because the hot material was on a slope and was being approached from the lowest point, there was a furnace action caused by the heat, which tended to draw up the slope not only the foul air immediately surrounding but also the fresh air from behind the nearby doors.

ONLY TWO ENTRIES FILLED WITH FRESH AIR

The foregoing remarks refer particularly to the actions of the gas observed as the fresh air was being advanced toward the fire. It must be remembered that the fire was in the heart of the mine and the entire mine had been sealed. In advancing the fresh air only one pair of parallel entries was used, one being the intake and the other the return, and the workings surrounding these entries were filled with the residual gas or oxygen-depleted mine air. The entries which were used approached the fire from the north end of the mine, while the single opening through to the outcrop at the south end of the mine was kept sealed, but, due to the fractured nature of the rock, the seal was not absolutely airtight.

The fan, as before stated, was a suction fan with a water gage of 1½ in., which meant that on the fresh-air side of all the stoppings, built to hold in the gas at the north end, there was a pressure less than atmospheric. These stoppings were also nearly, but not absolutely, gastight. Also the doors at the fresh air bases were constantly being opened and closed by apparatus men as they entered the gas to build new stoppings. It would be assumed that the lower pressure outside of the stoppings at the north end would at least partly overcome the tendency for fresh air to flow into the gas area when the gas was contracted, due to changes in barometer.

While the effect of the pull of the fan could not be detected on the daily recessions and advances of the gas, after a long period of time it was found that it had made some difference because the fresh air worked

in through the imperfect seal at the south end for a considerable distance.

When the fresh air had been advanced to a point adjacent to the hot caves left by the fire, great care was used in the construction of a stopping to keep the air from actually getting to the hot material, but after some preliminary work had been done (including a 200-foot crosscut to get above the big cave) and a number of explorations made, it was decided to make an attempt to load out the hot caves with men not cumbered with apparatus, which meant allowing the fresh air to get to them. Before starting, however, a system of bulkheads and stoppings was so constructed that at any time the fresh air could be excluded from the hot caves and the gas (depleted air) conducted to them. The one hundred million cubic feet of this gas which had accumulated in the mine as a result of the sealing of the fire was practically all held on the assumption that it might be needed as an aid in overcoming what was left of the fire.

COAL WAS SO HOT THAT IT IGNITED IN AIR

Two attempts were made to use fresh air, but both were unsuccessful. These efforts were concentrated on the big cave on the main slope near where the fire originated, and in places this cave was 30 ft. wide and 30 ft. high. The first attempt was made at the down slope end, but the fresh air was drawn through the hot material, causing it to re-ignite. When this oc-

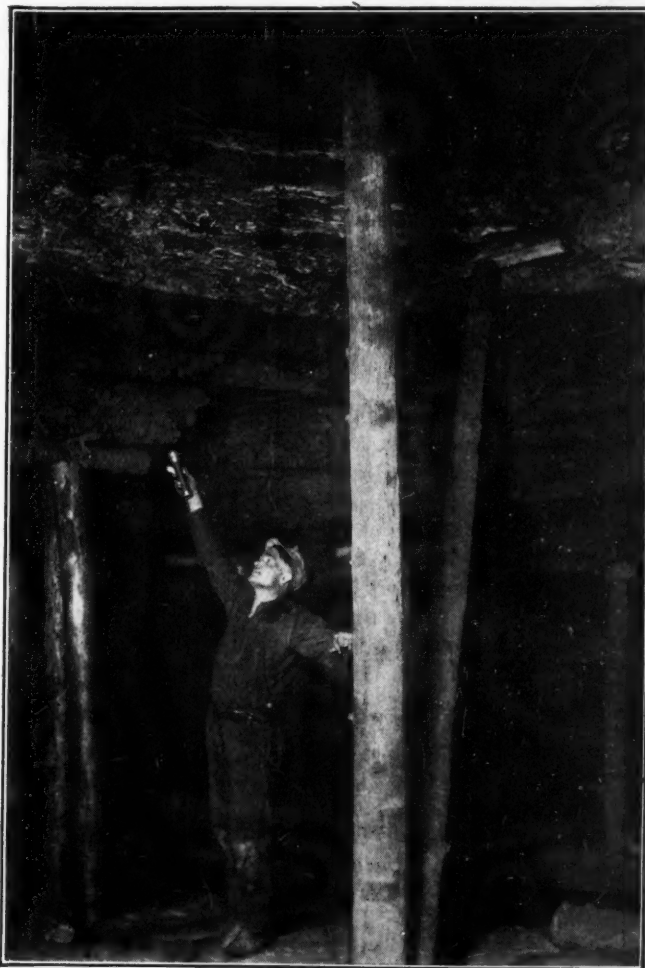


FIG. 2. ON TOP OF TIMBERING SHOWN IN FIG. 1

Shows the upper seam of coal and the rock caved above it. Here the apparatus men placed temporary posts which were replaced later by timber sets of more permanent character.

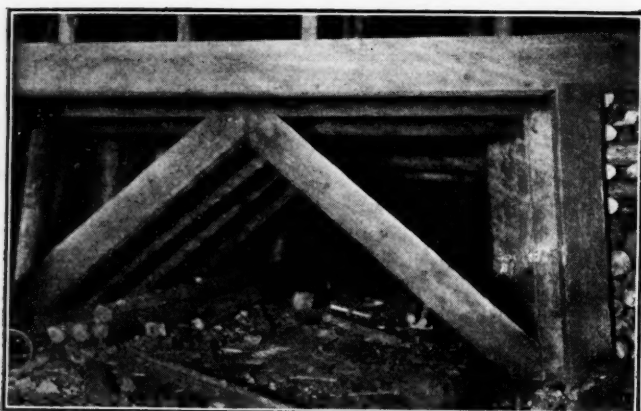


FIG. 3. TIMBERING ON TOP OF THAT IN FIG. 1
This is the permanent timbering placed by men working in fresh air on the top of the timbering erected by men breathing through apparatus.

curred the fresh air was excluded and the gas (depleted air) conducted to the flaming material. This immediately extinguished the flames.

The next attempt was made on the up-slope end of the big cave, as it was believed that the fresh air would not work down the slope into the hot material. This proved to be a mistaken assumption, however, for the fresh air did work down into the hot material, because the contraction of the main gas body more than overcame the draft which the heat caused to travel up the slope.

If it had been possible to surround the big cave with bulkheads the fresh-air attempts would no doubt have been successful, but, unfortunately, the big cave connected with other caves which led back into the south part of the mine, where the main body of depleted air was impounded. The caved material was so porous that when the barometric pressure started to increase and force the main gas body to contract, fresh air was drawn into the hot caved material.

WATER FROM HOSE MAKES MUCH STEAM

Some of the conditions observed during these attempts to work with fresh air were as follows:

First: It was impossible to get over the top of the cave, but water, through hose, was played on both exposed ends. It proved to have practically no effect. Experience showed that water is of little use on a large cave unless the material can be flooded. It is true that water from a hose will cool what hot material can be reached directly, but even then it causes so much steam that the men cannot work in it, and it greatly increases the sloughing from hot ribs and roof, with the consequent dangers from falling pieces.

Second: The fresh air leaking, or circulating, to a certain extent through the hot caves fed the smoldering fire, distilling inflammable gases from the coal. One sample of gas was taken which contained about 3.5 per cent carbon dioxide, 8.8 per cent oxygen, 2.2 per cent carbon monoxide, 3.4 per cent methane, 4.3 per cent hydrogen and 0.6 per cent ethylene (C_2H_4).

Third: Depleted mine air is the most effective weapon in fighting a fire, especially in a pitching bed where the air can be easily controlled. In this case the gas (containing a little less than 5 per cent oxygen and about 4 per cent carbon dioxide, with a temperature of about 64 deg.) stopped all blazing immediately, and where the cave was porous enough to permit good circulation it had a marked cooling effect; in fact, the

efficiency and easy control of the foul air was so marked that it was used in all the subsequent work and can be considered as the controlling factor in successfully overcoming the fire.

After it was found that fresh air could not be used, the possibility of flooding the entire area was considered. It was decided, however, that flooding was not practicable, due to the various directions in which the fire had spread, the number of bulkheads required, and the difficulty of placing them around it. Careful thought also was given to the possibility of leaving the fire sealed until there would be no possibility of fresh air re-igniting it. It was feared, however, that this would take too long a time (which later developments proved would have been the case), so the only recourse left was to load the hot material out with apparatus men working in the depleted air, which was so controlled that it would be conveyed to any point of operation.

It was found that by having the apparatus men shovel from the down-slope end of the hot caves the men could always be kept cool enough for effective work if the caves were sufficiently open to draw the gas through them. Sometimes work could be carried on from the upper end. This was when there was sufficient draft to keep the hot gas traveling over the men's heads against the roof. The cool gas would travel down the slope along the floor to the face of the hot cave, where it would become heated, rise to the roof and travel back up the slope over the heads of the shovelers.

One portion of the fire area caved so tightly that it was found impossible to maintain a circulation that would carry the hot gas away, and the men worked for some time in very high temperatures, some reaching 176 deg. The hottest places would always be against the roof, and when a blower fan was tried it stirred up the gas, causing the hotter part near the roof to be whirled down onto the men, making matters worse. On the other hand, when there was a good draft a stream of cool gas from a blower fan at the men's backs was very effective.

APPARATUS MEN CAN ENDURE GREAT DRY HEAT

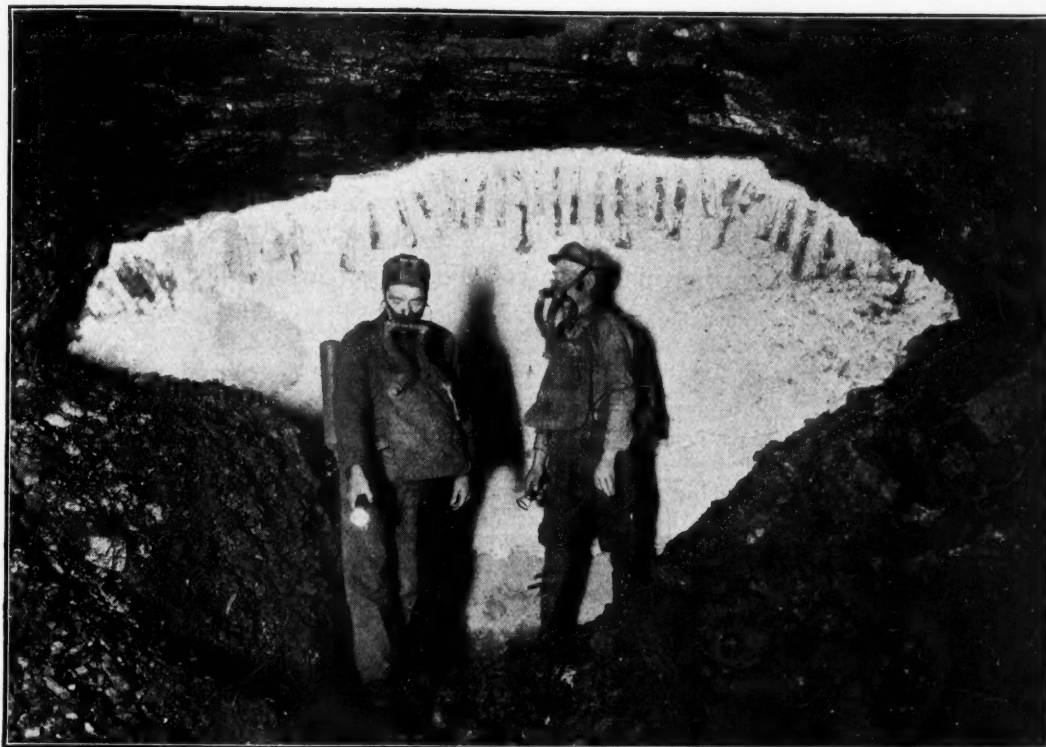
From actual experiments made, using a standard thermometer, it was found that apparatus men could remain for several minutes in temperatures of 190 deg. and could stay for at least one minute in temperatures exceeding 220 deg. When men entered these temperatures they were always perspiring profusely, and undoubtedly the film of perspiration protected the skin. At any temperature above 170 deg. if any of the men touched any metal part of his apparatus his skin was blistered, and as soon as the machine commenced to get heated through the discomfort of breathing increased rapidly. It should be remembered that the men were always wearing apparatus in these temperatures and the gas was dry. At one time, when hose were being used, 115 deg. to 125 deg. of steam-saturated air was found to be almost unbearable to men wearing apparatus. Also, we recall another mine where a temperature of 175 deg. of an almost saturated atmosphere proved absolutely unbearable to the flesh.

From careful observations made during the course of fire-fighting operations it was determined that the hot caves would not be re-ignited, but, on the other hand, the heat would be lowered by gas (depleted air) containing 5 or 6 per cent oxygen and about 4 or 5

FIG. 4

Stopping in Old Crosscut

The crosscut is closed by a plastered board stopping. The plaster used was hard wall cement and wood pulp. The illustration gives a good idea of the quantity of material that often had to be removed before rock and coal solid enough for a stopping could be reached. Note the soot on the roof.



per cent carbon dioxide. There is no doubt that some oxidation will continue in hot caves of coal as long as there is any oxygen in the air reaching them, but where the oxygen falls below 5 or 6 per cent and there is circulation, oxidation is not noticeable and is more than counterbalanced by the cooling action of the depleted air. When the percentage of oxygen rose to 7 or 8 per cent, oxidation would be more rapid, the fire would be brightened, the temperature would rise, smoke would increase, inflammable gases would be formed, and increased percentages of carbon dioxide would be found.

One branch of the fire burned up an abandoned and caved room on the first left main entry. As this was an abandoned part of the mine, it was left sealed off and is still under seal at the present writing. Access, however, was at all times provided to the down-dip end of the hot material, and temperatures were constantly taken. From the results of the temperature readings and the gas analyses it can be almost positively stated that this part of the cave has been hot enough to ignite with air up until the present time, which is fourteen months after the fire started.

MINE WOULD HAVE TAKEN OVER YEAR TO COOL

This particular place was never reached with any fresh air during the fire-fighting operations, so it can be inferred that it would have been necessary to keep the entire mine sealed for an equivalent time before air could have been admitted. The oxygen content in this room has gradually dropped to less than 1 per cent, and the carbon dioxide content increased to 10 per cent.

Before the mine was reopened after being sealed, a careful organization was worked out. It proved to be efficient and smooth working, there being no confusion at any time. A doctor also was kept at the mine day and night for several weeks. Two expert repairmen went over each apparatus (Paul apparatus were used) every time it came out of the gas, which proved to be an important safety measure. Most of the work

was done within 500 ft. of fresh air, and when carbon monoxide was present in the mine gas only short exploration trips were permitted; never more than 1,500 ft. and usually much less.

Even when no carbon monoxide was present the exploration trips were seldom more than 1,500 ft., although one trip of 2,300 ft. one way was allowed where absolutely no obstructions interfered with travel. This trip was made in an atmosphere containing about 6 per cent of oxygen with no poisonous gases. On long trips extra apparatus were carried, and a stretcher always was taken.

Although it is not believed that any unsafe trip was allowed, it should be borne in mind that this gas was being sampled daily and sometimes several times each day, and the apparatus men knew exactly what it contained and how to proceed in case of trouble with any apparatus. We are of the opinion that it is frequently foolhardy to take trips of 1,500 ft. in an atmosphere containing carbon monoxide and much more dangerous than taking a 2,300-ft. trip in an atmosphere free from it.

AT ABOUT 50 ILLINOIS shipping mines, producing approximately one-half of the state's total output, 500 tons (10 of the largest railroad cars) of coal, must be loaded each hour of the working day into pit cars, hauled a mile or more to the shaft, hoisted, screened and otherwise prepared and loaded into a railroad car for shipment to consumers. The man and mechanical power used at such a mine in a single week would prepare the land, plant, cultivate and harvest the crop from the entire overlying 2,500 surface acres of such a mine, and still have enough man power and mechanical energy left to carry the entire harvest to final market. The total investment in such a coal mine also would be from three to four times the value of the overlying 2,500 acres fully improved and used for agricultural purposes, estimating such land to be worth as much as \$150 per acre.

AN INVESTIGATION OF CAUSES of death among bituminous coal miners will be undertaken by the U. S. Bureau of Mines to obtain, if possible, the principal hazards connected with this industry, in order to better avert them.

Coal Analyses May Be Misleading Because of Crude and Insufficient Sampling*

Small Quantity Carefully Selected May Yield Impressive Figures, but Will Scarcely Be Representative of Shipments—To Be of Value to Purchaser, Average of Numerous Samples Taken Over Long Period Must Be Indicated

By O. P. HOOD†

Exclusive to *Coal Age*

TO OBTAIN a clear understanding of the part analysis may play in the purchase of coal let us follow the thought of analysis as it is presented for the first time to a purchasing agent. A short time ago I received a letter from a coal operator, carrying on the letter head an analysis of, let us say, Black Sambo coal, mined from No. 4 seam, Utopia, State of New Hope. It reads:

Moisture	1.46
Volatile	19.74
Fixed carbon	76.10
Ash	2.7
<hr/>	
Sulphur	100.
B.t.u. ....	.803
	15,177

The first innocent question is, "What is this an analysis of?" This may prove to be a delicate question. The inference one is expected to draw is that it is an analysis of a product that one can buy. But is it? This may be the analysis of a single sample taken in the mine at the face by a skillful mining engineer intent on advising his company as to the quality of the coal as it lies in the ground. If so, another engineer following the same method can go back to the same spot in the mine and get another sample that will check quite closely to this one. But the coal may vary from place to place in the mine, and an average of many samples taken throughout the mine would obviously be a much safer guide. These face samples represent the ideal product that could be produced from the mine with miners always selecting coal as did the original sampler.

HOW ANALYSIS INTERESTS THE PURCHASER

The buyer is interested not in what is in the ground but what gets into the car shipment, so that this suggests an entirely different kind of sampling. The analysis quoted may, therefore, be a tippie sample taken to represent a carload, a day's run, a cargo shipment, a week or a month's production, or an average of many delivered samples extending over a period of time, and representing a very large tonnage of coal actually delivered. It is obvious that the value of the analysis grows as it represents a larger and larger quantity of delivered coal. Some of the best operators have a sample properly taken of each day's output as it goes into the cars. The ash content is determined for each day, and these figures are plotted on a monthly report as a curve from which it usually is possible to indicate holidays and pay days from the rise in the ash curve. The quality from a given mine varies through a certain range, depending upon many mining conditions and the state of the market. The analysis of interest to the purchaser would, therefore, be an average of a large

number of samples representing a considerable quantity of delivered coal extending over a considerable period of time. He would be interested, also, in analyses showing the probable variation to be expected in delivered coal from the particular mine in question.

Specific information of this sort is exceedingly rare, in spite of the great amount of coal analyses that have been made. It so happens that the Bureau of Mines has many analyses of delivered coal from the seam referred to. In making a comparison with these published records the analysis seems quite normal, except in the matter of ash. This coal comes from a very low-ash field, and analyses as low as that of 2.7 per cent ash have been recorded, but the average from 36 mines shows ash, 5.9 per cent, with the lowest 4.22 per cent and the highest over 12 per cent, and two deliveries from the very mine referred to ran 5.9 per cent and 6.9 per cent, instead of the 2.7 per cent quoted. From this it would appear that the analysis in question was not representative of quantity production at least, but probably of a selected sample or a mine sample.

WHAT DOES THE ANALYSIS REPRESENT?

An analysis is of little value unless you know what it represents. There are many published analyses useful to the geologist and the student of coal measures that must be used with great caution in commercial deliveries. The wrong use of analyses has led to disappointment and to an unjust condemnation of buying on analysis. The sample, therefore, should be of delivered coal, and should be so taken as to be representative. To obtain a representative sample is found in practice to be far from simple. The art of sampling is highly developed in the buying of metalliferous ores. It is perfectly obvious that in buying a carload of gold or silver ore much depends upon the method of sampling. Iron ore is all carefully sampled and priced according to analysis.

Coal is frequently worth more per ton than either gold or iron ore, and the same refinements in principle must be observed in sampling coal as in other sampling. A standardized method of coal sampling has, therefore, been adopted, and must be followed to obtain a just sample. It is worse than useless to make an analysis of an unfair sample. Much of the complaint about buying on an analysis basis hinges on this matter of sampling. The analysis method should not be used unless one is prepared to undertake righteous sampling. During the war an official complaint was made concerning American coal received at a certain foreign port. A foreign fuel-testing laboratory reported over 30 per cent ash. Such a charge against American coal seemed serious, and the Bureau of Mines sent a man to Europe to follow the coal from its landing to the hands of the consumer. Observations were made of the method of

*Based on an address to the New York chapter, National Association of Purchasing Agents, Feb. 21. Second and concluding installment. The first part appeared last week.

†Chief mechanical engineer, U. S. Bureau of Mines.

sampling. A young man with a small handbag, or valise, went on board the boat, selected several handfuls from various parts of the coal that he could get at, until not over 10 lb. had been selected. This formed the gross sample to represent the cargo. It was so manifestly unfair and inadequate that the whole report was discredited. An analysis of such a sample was worse than useless.

A study of the theory of sampling soon shows that a relatively large gross sample—1,000 to 2,000 lb.—is necessary, and that there should be crushing facilities to reduce the size of particles. This immediately shows that proper sampling means much hard work unless mechanical devices are available. Furthermore, a cargo should be represented by several such samples taken in equal small increments throughout the whole period of unloading. Without special mechanical devices it is practically impossible to take a fair sample except as coal is being moved from one container to another. Settlements based on haphazard sampling are apt to be unjust, unless many samples are involved.

Two organizations were sampling coal as it was loaded for foreign shipment. Both sets of samples were analyzed in the same laboratory. One organization was believed to be unskillful in its method of sampling, and some thousands of analyses representing more than half a million tons in each set were compared. The average heating value of the two sets checked within two B.t.u. in a total of over 14,500, but the range in variation of ash and moisture was twice as great in the one set as in the other. This shows that while great reliance can be placed upon averages of many determinations, one must not expect an undue degree of accuracy in any one determination, especially if the greatest skill is not brought to bear on the work.

INFLUENCE OF LABORATORY METHODS

Examining again the typical analysis carried on the letterhead of the coal company, one notes that six items are given. If this is of a single selected sample, as we have reason to think, how close to the facts is the moisture determination, say, which is quoted as 1.46 per cent? This particular coal belongs to a type having a very small amount of inherent moisture. If it had been a Midwest coal the moisture would have been between 8 and 17 per cent. In any event, a change in laboratory method might have changed the figure 10 or 15 per cent of itself either way. The volatile matter is reported as 19.79 per cent. Failure to rigidly observe the same standard methods of heat treatment in different laboratories may result in deviations of 2 or 3 per cent in the amount of volatile matter and fixed carbon reported in the same sample of coal.

The ash determination is similarly affected by method and computation corrections. The heating value determination may vary 50 to 100 B.t.u. in duplicate determinations. The point I wish to convey is that while there is a satisfactory and reasonable commercial accuracy in analytical work of this kind, it is not the same degree of accuracy that we expect in a multiplication table or a table of income yield at certain interest rates. The figures must be used with a knowledge of their limitations in order that justice may be done, and no hair-splitting arguments or settlements should be based on small variations in the figures. Fortunately, the value of analysis as a guide to rational buying does not depend upon small decimal differences.

A coal dealer anxious to sell to the Government Fuel Yard represented his coal as having not over 8 per cent ash, and desired to send a sample carload. The ash ran 16 per cent. Anthracite No. 3 buckwheat had been obtained for many years running about 16 per cent ash. The ash increased during war time to above 22 per cent. A proposition to abandon the use of anthracite and put in fuel oil brought the ash down again to about 16 per cent. The possession of records of actual quality from year to year made a perfectly definite statement of the case possible. Such work does not depend upon hair-splitting fractions, but does depend upon good sampling and many analyses. If one is to use analyses in buying coal, the number of samples and analyses should be liberal and the work should be well done, or not begun. This brings one to the question of cost of such work.

In general, it costs too much for national introduction, except where the work can be systematized and applied to a considerable tonnage. There is no question as to the advantages for the large consumer of coal, but the practice of the relatively few large consumers has little bearing on the general fuel problem as represented by the multitude of buyers of coal. The very large buyers of coal are amply able to take care of themselves in this matter, but the great complaint of the public about coal quality comes from the multitude of moderate and small buyers who individually cannot use analysis in buying coal, but who nevertheless form public opinion about the coal business, and threaten to interest themselves in the conduct of the business.

PRODUCER SHOULD CLEARLY DEFINE PRODUCT

Many forces urge various legislation, either local, state or national, that gives expression to discontent with quality, price or service, but which would be inoperative if attempted. Eminent opinion has it that the coal business functions poorly. If evolution into a better order of things is to proceed it seems to me that one of the first essentials is to provide satisfactory conditions for intelligent and satisfactory bargain and sale. There must be means for more clearly defining what the producer has for sale, means whereby the buyer can more readily match his needs against the offered article, and means for determining whether the material delivered is as represented. Whenever a commodity of lower value receives a higher price than it should there is an economic waste, and also when a product of higher value is forced to accept by competition a less price than its worth there is economic loss. This all leads back to adequate sampling and analysis as the element in the problem capable of numerical expression and having in general the closest relation to practical inherent values.

I believe a time will come when it will be recognized by both producer and consumer that some system of inspection and grading of coal will be of mutual advantage. It has been declared that coal is a matter of public interest. The system of inspection should be national, the same as the grading of other primary products such as wheat, cotton, meat, etc. Some of the principles of the pure food law also apply in that the thing presented for sale should be what it purports to be.

The Bureau of Mines has for some time past given consideration to the matter of coal classification. American coals are of such great variety and pass from

one grade to another by such small differences in chemical, physical and other useful qualities that classification must use more or less arbitrary dividing lines. Preceding general coal classification there must be a method and mechanism for accurate and satisfactory sampling of coal as delivered in order to place the coal in the proper class. It is obvious that a sample must be thoroughly representative of the whole shipment of coal under consideration, else injustice and dissatisfaction will follow. This sampling and analysis of coal has been the subject of study and practice by the bureau for more than ten years past, and methods have been devised which have proved satisfactory to many purchasers and operators. It is believed that an application of these methods on a comprehensive national scale is possible.

Secretary Lane proposed three years ago a bill based upon this experience of the Bureau of Mines and upon the belief that while the expense of operation should be borne by the industry, the mechanism for inspection and analysis should be in the hands of the government, since it had become apparent during the war that such mechanism was sorely needed as a national protection in time of stress.

A method which the Bureau of Mines believes is practical is to establish coal-sampling stations at railway gateways or other convenient locations where representative samples can be taken when desired of the coal shipped. The analysis of this coal, accurately determined and supplied to the operator, will enable him to declare a standard for his coal which, because of the particular bed, mining methods, means for preparation and class of custom, he knows that he can maintain. This standard being published by the government, gives accurate information to the buyer of what he can expect from that mine. The inspection service would discover whether shipments of coal were being maintained within the declared standard. This information would be given to the operator and the public, and the operator would be allowed to advertise that his mine produced coal whose quality was certified by the government. If shipments became sub-standard this privilege would be withdrawn and the operator required to declare a new standard which he could maintain or forego the advantage of government certification of quality.

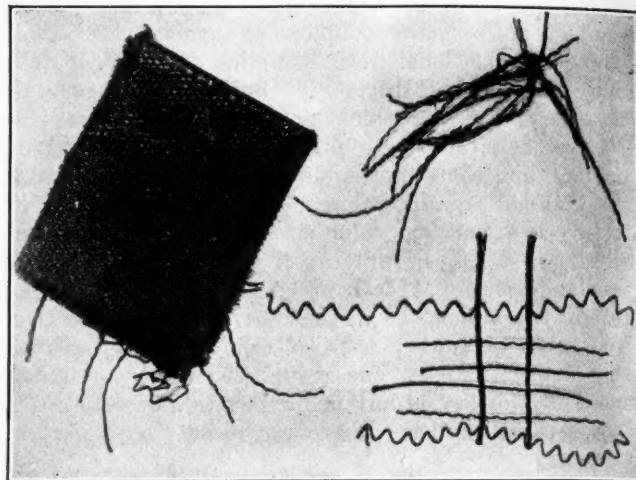
The certification of quality by the government is of value to the operator because of confidence inspired in the purchaser and for protection from unjust charges concerning dirty coal which result from practices of other shippers. The certification of quality by the government is of value to the purchaser in giving him reasonable assurance of uniform quality of coal.

With suitable means for sampling commercial shipments and means for determining coal quality that can be expressed in figures, the first essential of coal classification and control of quality will be available. When attempted in a large way as an engineering problem comparable in importance with efficient loading, transporting and unloading devices, fuel sampling in transit and analysis can be brought down in price to something like \$1.50 per sample. When a buyer has a specification of what he can expect, and means are provided for determining whether he gets what he pays for, there will soon be available a satisfactory basis for commercial classification of coal which it is believed will largely take care of itself. Purchasing coal under such a system would be greatly simplified.

Woven Cotton Belt Has Great Flexibility

AWAY back in the early part of the age of savagery, man, finding his own hide inadequate for comfortable protection from the elements, proceeded to cover his body with the skins of animals. With the lapse of time and the accumulation of knowledge, he has gradually discarded this primitive body covering until today about the only remnants of skin clothing remaining in habitual use are the waist belt and the shoe. The reason for this evolution is apparent—something better, lighter, warmer and more pliable may be made from cotton or wool.

In like manner when man began to use forces greater than either his own or those afforded by the muscles of his domestic animals, when he learned to utilize the energy of falling water and began to experiment with the possibilities of steam, he used leather for transferring power from one revolving shaft to another.



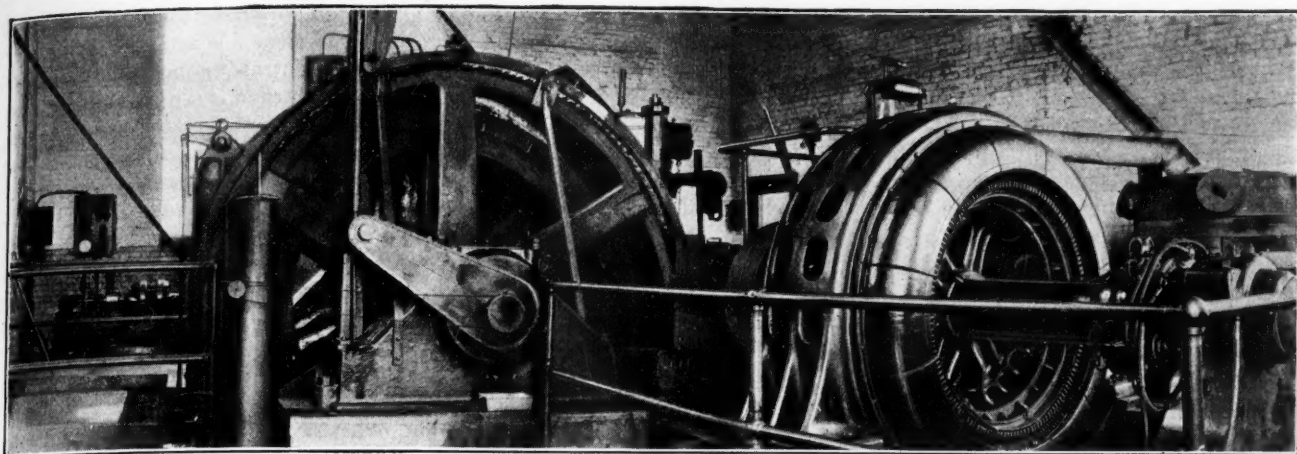
SECTION OF WOVEN COTTON BELT

Note the ravellings in the right-hand corner—the straight and heavy yarns that give longitudinal strength, the light cross fibers that hold the belt sideways and the crooked ravellings at the top and bottom which have attained their present condition by having been weaved back and forth through the belt at right angles to the plane of its surface. Though it is a one-ply belt, it is thick, yet readily flexible.

And even to this day the leather belt forms one of the most common and best-known means of transmitting mechanical energy.

One of the greatest shortcomings of the leather belt is the fact that to assure even a reasonably long life and good running, the ratio of the pulley diameter to the thickness of the belt must be large—as a rule at least thirty and preferably forty or more. If a large ratio is not maintained the fibers on one side of the belt are unduly stretched in rounding the pulley, while those on the other are unduly compressed.

To provide a belt of comparatively extreme flexibility, to surmount the shortcomings of skins for belting as they have been overcome for clothing, the Buckner Process Co., of Worcester, Mass., is now manufacturing a belt woven from heavy cotton yarn that has been impregnated with lubricant. The weave of this belt differs radically from that ordinarily employed, the belt being composed of three sets of fibers or yarns running in three directions at right angles to each other. An idea of the appearance of the finished belt as well as of the three sets of fibers, or yarns, after unravelling from the cut edges may be gained from the above illustration. It is marketed under the trade name Lion's Paw by R. D. Skinner, 70 East 45th St., New York City.



LIQUID-CONTROLLED HOIST AT MATHER, GREENE COUNTY, PENNSYLVANIA

Liquid Controller Reduces Peak Loads by Providing for Uniform Acceleration of Large Mine Hoist

A 1,000-Hp. Motor Driving a Hoist Is Uniformly Brought Up to Speed by Means of a Liquid Rheostat—Except for the Low Hum of the Motor, Silence Reigns in the Hoist Room

BY DONALD J. BAKER
Charleston W. Va.

AMONG the interesting installations of hoisting equipment that have been made in western Pennsylvania during the last two or three years that at No. 1 mine of the Mather Collieries Co. at Mather deserves attention. This machine was designed by the Allis-Chalmers Manufacturing Co., of Milwaukee, Wis., to handle 3,000 tons per 8-hour shift from a shaft 350 ft. deep.

The mine has been laid out for a daily production of 6,000 tons, but this will be attained only when a duplicate tippie and hoisting equipment operating at a second opening, not yet sunk, has been installed. The cars, which are of 2½-ton capacity, are brought to the surface on self-dumping cages, and although the hoist used is unusually large for the Pittsburgh region the interest does not center on that fact but on the method by which the hoist is controlled.

Except for the humming sound made by the motor and drum the hoist room is silent. There is none of that clatter of closing contactors cutting out various units of resistance behind an expanse of switchboard as is heard in many hoist houses, for no switchboard is installed. The motor accelerates uniformly, and the layman can scarcely detect from appearances that the operator in bringing the drum up to speed.

A 1,000-hp. 2,200-volt reversible motor is back geared to a Vulcan hoist, the drum of which is conical, varying from 7 to 11 ft. in diameter. The control equipment, housed in a wing of the building, consists essentially of a primary reversing switch and a tank containing an electrolyte solution governing the secondary circuit. The primary of the motor is controlled through two magnetically operated reversing switches interlocked and so arranged that only one can close at a time.

For control of the secondary a steel tank with insulated lining is employed. This is divided into an upper and lower compartment, the latter being utilized as a

storage and cooling chamber for the electrolyte. This liquid is nothing more than distilled water in which a certain amount of sodium carbonate has been dissolved in order to give the water the desired conductivity. In the upper compartment the electrodes, consisting of a series of plates connected to each phase of the rotor circuit, are suspended from an insulated support.

Four sets of electrodes are employed, the two end plates being connected in parallel to one of the slip rings of the motor. The two remaining sets of plates are connected with the other two slip rings. These electrodes are fashioned to special shapes so as to obtain gradual changes in resistance. They are so designed and spaced that a balanced three-phase secondary circuit is obtained.

The resistance in the rotor circuit and consequently the speed of the motor is governed by the height of the electrolyte in the upper compartment as it rises upon and finally covers the electrodes. The level of the electrolyte in this upper chamber is controlled by the operator through a system of levers by means of a multiple-shutter type of weir placed at one end of the tank. This weir embodies three or more shutters or valves connected to a common operating rod. When the hand-lever control on the operator's platform is in the off position, these shutters are all wide open. Similarly when the lever is in the full running position, the shutters are all closed, their overlapping edges being carefully machined and fitted so as to reduce leakage as far as possible.

Only one hand lever is employed in operating the controller, both forward and reverse rotation being obtained with it. The direction either forward or backward in which this lever is moved from the central or off position determines the direction of rotation of the hoist. Moving the lever forward from the central position actuates a small master switch mounted on the con-

troller base. This closes the primary side for forward rotation of the hoist motor. A further forward movement of the hand lever gradually closes the weir in the tank, causing the level of the electrolyte to rise. This decreases the resistance offered to the passage of current and brings the motor up to speed.

Returning the lever to the central position opens the weir, which in turn lowers the level of the electrolyte, thus inserting resistance in the rotor circuit. Full resistance will be thus inserted before the operating lever reaches its central position. The movement to the off from the running position also opens the master switch, thereby permitting the primary switch to open, thus shutting off current to the motor. Movement of the lever in an opposite direction from the central position induces a similar cycle, except, of course, that the direction of hoist rotation is reversed.

CHANGE IN IMMERSION AREA VARIES RESISTANCE

Motor speed is controlled by varying the secondary resistance in the rotor circuit. This variation is obtained through the changing area of immersion of the electrodes in the electrolytic bath. A small motor-driven centrifugal pump mounted on the base of the tank keeps the electrolyte in constant circulation from the lower to the upper compartment. The upper chamber of the tank is provided with a small reservoir that retains a predetermined quantity of the solution, into which the electrodes always project a certain distance. Thus the secondary circuit is never entirely open. When the control lever is in the off position the electrolyte overflows the lip of the reservoir and returns to the lower compartment. As the controller is moved toward either running position, the primary switch closes, as already has been described. The weir shutters also begin to close, causing the electrolyte to rise, cutting out resistance and bringing the motor up to speed.

Any desired intermediate speed may be maintained by manipulating the lever controlling the width of opening of the weir shutters and consequently the depth of the

electrolyte in the upper compartment and the degree of submergence of the electrodes. When the controller lever is thrown over to full running position the electrodes are completely submerged. To the upper extremities of the electrodes horizontal plates are attached, so arranged that upon their complete submergence the secondary is practically short-circuited. No other short-circuiting device need be provided. Some resistance, of course, remains in the rotor circuit because the current has still some small distance to travel through the electrolyte in passing between the short-circuiting plates. But the slip imparted to the motor on this account is limited to about 1½ per cent.

Because of the short-circuiting arrangements in the secondary circuit it is possible when lowering a heavy load to use the motor as an induction brake without any excessive overspeed resulting. In an installation of the type here described but not the one installed at Mather a trip of loaded cars is lowered down a long incline, using the motor as an induction brake, obtaining full load torque on the machine with an increase above synchronous speed of only 6 per cent.

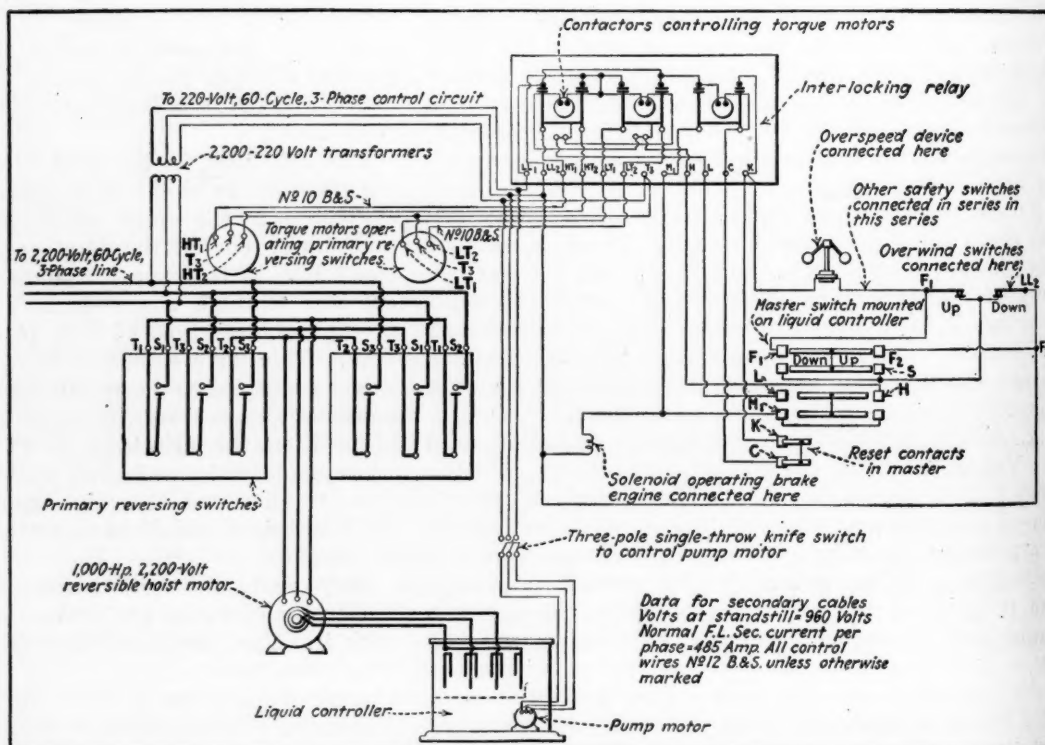
DISCHARGE VALVE CONTROLS HOIST ACCELERATION

A control valve fitted with an adjustable segment is placed in the discharge pipe of the pump by which the electrolyte is circulated. By varying the opening of this valve the rate of acceleration of the motor may be accurately controlled. Actual tests show that the period of acceleration can be varied from about eight seconds to over two minutes. Full resistance can be inserted in the rotor circuit by the hoist driver in about two seconds. He can at once move the controller lever to full running position, whereupon the motor will come to full speed gradually and smoothly in the predetermined time as fixed by the setting of the pump valve. With the rate of acceleration governed in this manner the operator cannot in anywise damage the motor by causing it to pick up speed too rapidly.

The liquid type of controller as installed at the Mather

Wiring Diagram

Of hoist control at Mather Collieries No. 1 Plant. By varying the depth of the electrolyte the resistance of the secondary circuit can be made large or quite low at will. As the water rises regularly in the tank the decrease in resistance is equally regular and the acceleration of the motor is similarly steadily increased. There is no sudden inflow of current as when an ordinary contactor is brought into play. As someone has put it, the current goes up an easy ramp instead of up an oversteep stairway.



plant has many advantages. As the resistance is gradually reduced with the rise of the electrolyte, the acceleration is even and steadily progressive. This is in marked contrast to the regulation afforded by metallic controllers, where the resistance is increased not continuously but by definite steps. This is particularly objectionable in starting if slack must be taken out of the rope.

The electrodes are so designed that for purposes of shaft inspection or repair the cage may be moved at a slow speed. With controls other than those employing the liquid rheostat, special provision must be made for this duty. With the liquid controller, however, no moving or arcing contacts are present and as a result no excessive repairs are necessary. All the difficulties attendant on the arcing of parts also are entirely lacking.

The controller at the Mather shaft is compactly built and conveniently housed. No switchboard is necessary and little copper is required to make the connections. The hoist can be run at reduced speed over long periods of time without the possibility of burning out the resistance. Though the electrolyte in the upper compartment will become heated, it is cooled by a system of water coils in the lower chamber. Changes in the resistance offered by the controller easily may be made at any time to suit any special operating conditions. This is done by simply changing the "strength"—that is, the degree of concentration—of the electrolyte. In first cost also the liquid controller compares favorably with those of older type. Heretofore the chief objection to this type of control has been the fact that an excessive amount of resistance remained in the rotor circuit unless resort was made to a complicated short-circuiting device. This objection is overcome by the introduction of the short-circuiting plates above mentioned, which reduce to a negligible quantity the resistance left in the rotor circuit.

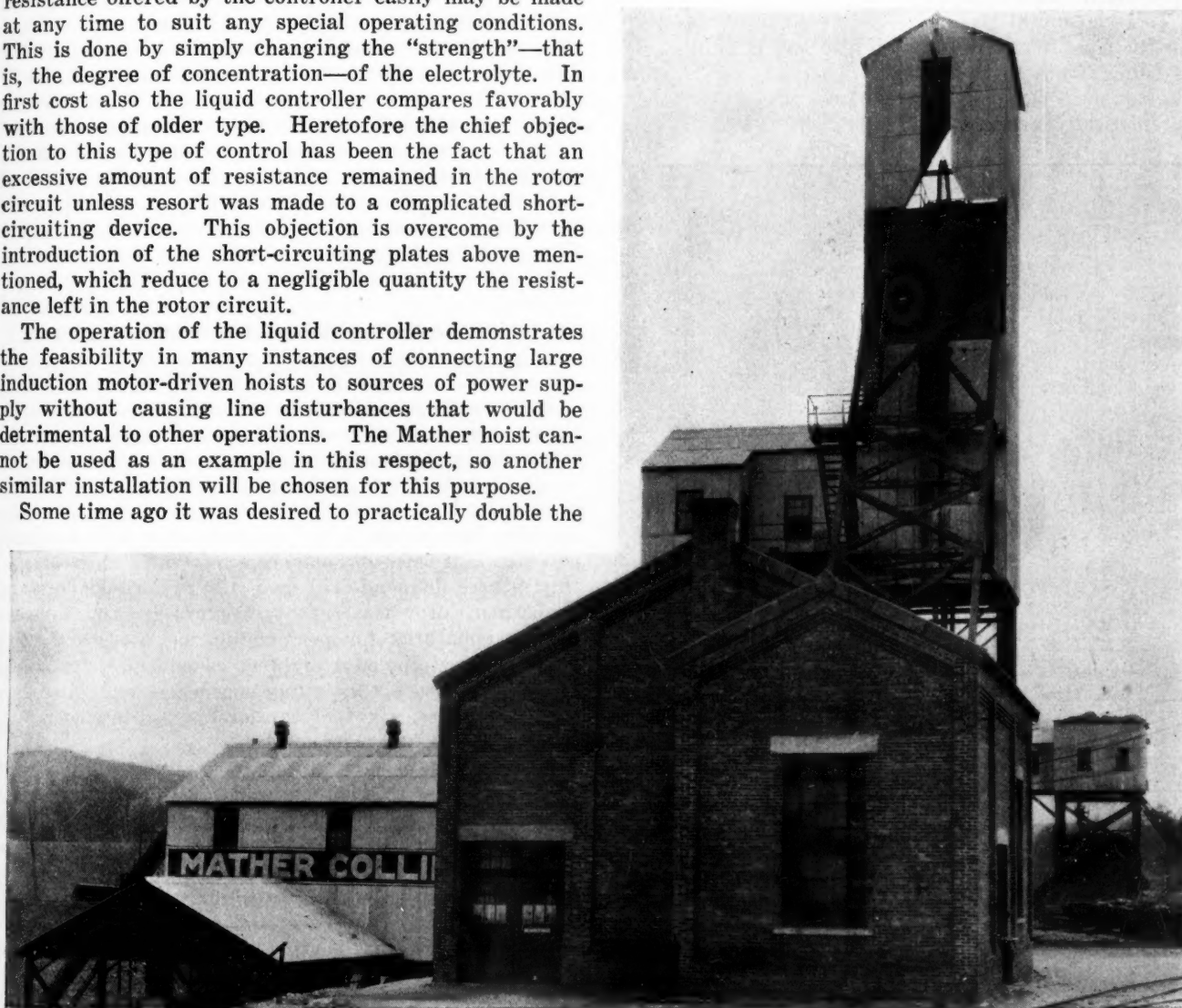
The operation of the liquid controller demonstrates the feasibility in many instances of connecting large induction motor-driven hoists to sources of power supply without causing line disturbances that would be detrimental to other operations. The Mather hoist cannot be used as an example in this respect, so another similar installation will be chosen for this purpose.

Some time ago it was desired to practically double the

output handled by a double-drum hoist at a plant in West Virginia. This unit at the time was driven by a 350-hp. induction motor with contactor control. The peak in starting was about 850 hp. This machine was supplied with energy from the mining company's central station, which was loaded practically to capacity. As a result the operation of the 350-hp. hoist motor caused fluctuations in line voltage which were clearly evidenced by an appreciable flickering of the lights.

After a careful study of conditions it was decided to speed up this machine and equip it with a 600-hp. motor fitted with liquid rheostat control. With the new installation the peak at starting amounted to about 1,100 hp., but the effect on the line current with the 600-hp. motor and liquid control was less appreciable than that which had obtained with the 350-hp. motor and magnetic apparatus. The acceleration of the hoist under liquid control is so gradual that the governor on the 2,500-kw. generating turbine has time to pick up and follow the load variations, thus responding to the line demand.

It has generally been contended that a complete hoisting cycle occupying approximately twenty seconds and covering a distance of 500 ft. could not be made with a liquid controller, as it would be impossible to accelerate



REAR VIEW OF MATHER COLLIERIES HOIST HOUSE WITH TIPPLE IN BACKGROUND

This plant has a capacity of 3,000 tons per eight-hour day. The mine is laid out for a production of 6,000 tons, which tonnage would require, however, a duplication of the present tibble and hoisting equipment. The wing of the hoist house, containing the liquid controller, the primary oil switches and two magnetically operated reversing switches, may be seen in the foreground.

satisfactorily in a period of from five to eight seconds, as would be necessary in order to obtain a cycle of this duration. The results achieved at the plant alluded to refute this contention, as such a cycle is regularly attained. Furthermore this installation has proved that the operation of the liquid controller on such a cycle is not only feasible but reliable and practical. At Mather the hoist engineer is able easily to average three round trips per minute. This speed he attains whenever occasion requires. A full test of hoist capacity, however, has never been made.

A number of safety features have been incorporated in the hoisting equipment at Mather to protect the hoist in any emergency. Thus the drum cannot back away because of overload or power failure. It will not start after such an occurrence when power returns, even though the control lever be left in the running position. In event of overwind the hoist is automatically stopped and in such a case the driver is unable to start it again in the same direction in which it was traveling when the overwind occurred but must reverse the machine in order to resume normal operation. The hoist is automatically shut down if the operator does not keep the brakes adjusted or if the wear and tear upon them become excessive.

To reset any of the safety devices it is not necessary for the hoist driver to summon help, nor is he in danger of being struck by flying levers when any of the safety mechanisms operate. In case of overspeed the hoist is automatically brought to a stop; an emergency push

button also is provided by means of which the hoist engineer can cut off all power and stop the machine in case of emergency. And lastly, all electrical devices and switches are so protected that accidental contact with them is impossible. None of the safety features mentioned interferes in the least with the normal operation of the hoist.

Two Metal-Mine Developments Suggestive Of Anthracite-Mine Possibilities

COAL-MINING engineers may grasp in a measure the size of some metal-mining developments from a paper presented at the recent meeting in New York of the American Institute of Mining and Metallurgical Engineers showing that the Phelps-Dodge Corporation is removing a small mountain known as Sacramento Hill, located near Warren and Bisbee, Ariz. That company will lower this mass of rock 716 ft. The material is removed by seven 103-ton shovels with 3½-yd. dippers, having a maximum lift of 37½ tons. Its Western Wheel dump cars have rated capacities of 20 and 25 cu.yd. and are operated by compressed air. The fifteen locomotives in use each weigh between 53 and 54½ tons.

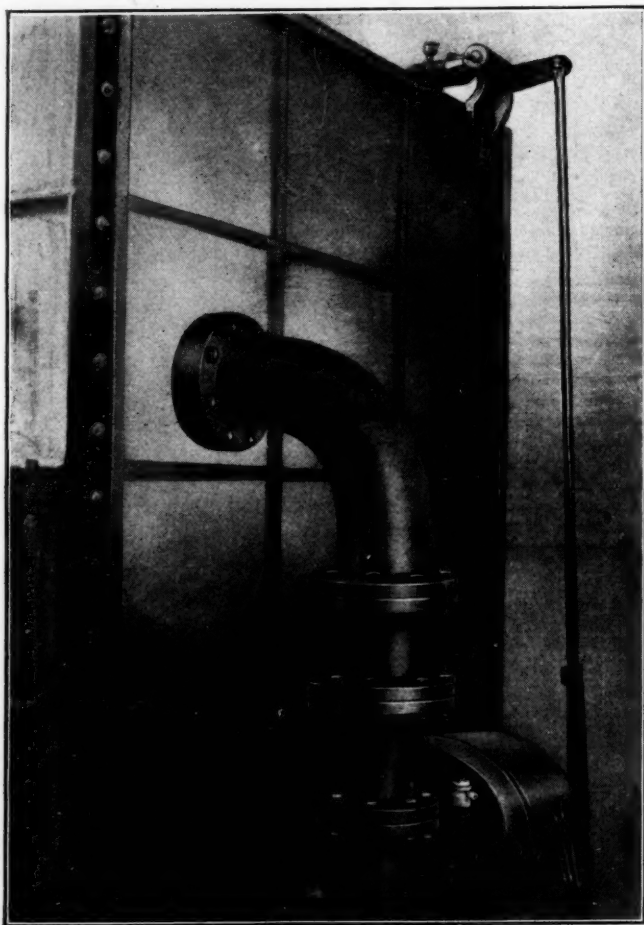
All the waste material passes over 2½ per cent grades with switchbacks, so that the train may reach a favorable elevation for dumping. The Phelps-Dodge Corporation does not believe that because it has a big job it should attack it with small equipment. The shoveling on Sacramento Hill is quite similar to that in the anthracite region only harder for the most part, but the equipment used in the hard-coal region is for the most part much smaller. If it were heavier the range of permissible stripping would be greatly increased. Though hills of the order of that near Warren, Ariz., could not be tackled to obtain anthracite, far larger excavations than now are usual could be made where the coal is thick, clean or in danger of fire.

FLOODING WITH SILT IS EXTINGUISHING FIRE

Another example of a metal-mining problem similar to that encountered in many anthracite mines is the extinguishment by hydraulic filling of a mine fire on seven levels of four mines in Butte, which was described in a paper by H. J. Rahilly, presented by W. P. Daly at the meeting just referred to. In this work one foreman, two assistant foremen, one office man, nine shift bosses, thirty-three diamond-drill men, 130 miners, loaders and timbermen, of whom seventy-five are trained to wear oxygen apparatus for performing the necessary work in gas, twelve pipe men, eighteen cement-gun men, three discharge men, six hoisting engineers, one oiler, six station tenders, six tool carriers, six drain men and twenty laborers are employed.

The material used is tailings rock, all but 0.70 per cent of which is less than 40-mesh and 58.40 per cent passes a 280-mesh screen. The filling is carried down the shaft by 6-in. cast-iron pipes and is distributed by both 6-in. cast-iron and 4-in. cast-iron and wrought-iron pipes, being fed into the burning area through diamond drill-holes or through old concrete bulkheads which were broken through by blasting, the men using oxygen breathing apparatus.

In this work the drillholes are used where the rock is prohibitively hot. The water is drawn off at lower levels and pumped back to the surface. It is found that if the pressure head is 100 ft. the fine slimes will travel on the levels from 800 to 1,000 ft. from the point where



LIQUID-CONTROLLER TANK

By means of the centrifugal pump at the foot of the illustration the electrolyte is kept in continuous circulation from the lower to the upper compartment of the tank. Note the operating rod on the right. The hoist operator manipulates this when opening and closing the weir shutters in the upper compartment.

they are discharged, thus filling up a large area. Pressure heads of 500 ft. have been used. The material flushed into the mine contained 25 to 30 per cent of solids. Two-inch water lines follow the tailings pipe, connections with 2-in. valves being made at all curves and junction points, in order to flush the tailings pipe with clear water after shutting off the tailings, because if the solid particles are allowed to settle they will tend to plug the pipe line.

Telephones are installed at points convenient to each discharge place so that communication can be established between any part of the mine or surface. This is very important because: (1) All valves must be set properly before changing the sand from one working to another, otherwise the pipe line would be plugged. (2) The pipe must be flushed thoroughly with water after filling a working, otherwise the sand would be likely to settle and plug the pipe. (3) The flow of sand can be changed quickly to places unaffected should leaks through the ground or breaks in the pipe line occur. The sands are run into any one working from four to eight hours continuously and then the flow is changed to another working, enough places being kept available for continuous operation. Sand is run into no working for more than eight hours in each forty-eight.

After a working has apparently been completely filled, a few holes are drilled into it to make certain that no openings are left and that no gas or fire exist; also an accurate account of the quantity of sand flushed into any working is kept and an approximation of the quantity of material that the stope should take is made from the maps.

Declares Permissibles Are Superior to Black Powder for Coal Blasting

THAT the use of permissible explosives in coal blasting operations is not only safer but in the final analysis more efficient and economical than the use of black powder is emphasized by H. Foster Bain, Director of the Bureau of Mines. The present closely competitive market in bituminous coal forces the operator to produce the maximum amount of lump coal, which commands a higher price than the smaller sizes, declares Director Bain. This in turn leads the mine operator and superintendent to produce the greatest possible percentage of lump coal with as little fines and slack as is possible. It has been brought to the attention of the bureau, however, that there is a belief at some mines that a somewhat larger percentage of lump coal may be obtained by using black powder as an explosive than one of the permissible explosives on the Bureau of Mines' list.

To those companies that have adopted the use of permissible explosives the bureau wishes to state that permissible explosives, if properly used, in not excessive amounts, will not produce any more slack and fines than will black powder. The Bureau of Mines believes that a man who will use permissible explosives without skill will likewise use black powder without skill.

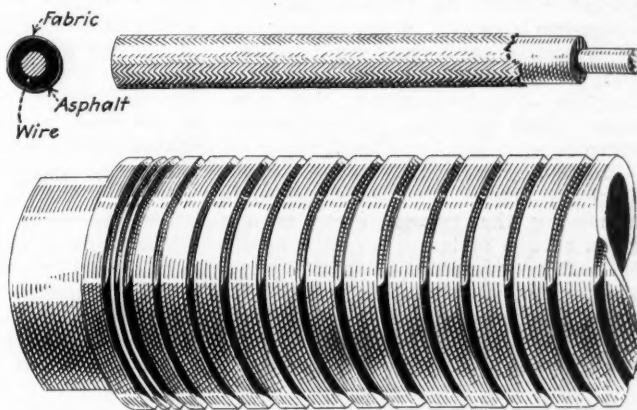
To those operators and superintendents who have not yet adopted permissible explosives, the bureau emphasizes that the gain in safety to the miners and the mine and, in the long run, the consequent decrease in the cost of operating the mine, more than offset any extra cost of permissibles or slight loss of lump which may occur until the miner learns how to load and fire properly his permissible explosive.

Wire by Which Wood Pipe Is Bound Is Laid In a Groove and Coated with Asphalt

WOOD pipe in a mine fails not from the impermanence of the wood but from the corrosion and the breaking of the bands by which it is bound together. With the winding wire properly protected from the corroding effect of the mine waters wood pipe will have a life of many years. The mine water preserves wood, but it is of no avail if the binding wires or bands are destroyed, causing the pipe to fall apart.

For this reason the American Wood Pipe Co., of Tacoma, Wash., uses a wire covered by a heavy coating of specially prepared asphalt. The covered wire is then run through a braiding machine which firmly binds the asphalt on the wire with a cotton braid. If it were not for this braid, much of the coating would be scraped off in the process of banding.

A section of the assembled pipe is then placed in the banding machine and the coated wire is wound spirally round the pipe under high tension. The banding machine has an attachment that cuts a groove in the pipe ahead of the wire, which sets into the groove so snugly that



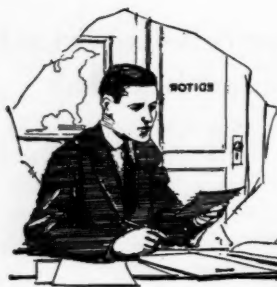
COVERING OF WIRE BANDS ON MINE PIPE PROTECTED FROM ABRASION BY INSERTION IN GROOVES

The lower part of the illustration shows the spirally grooved pipe ready for the insertion of the wire by which the pipe is bound. A wire is used instead of a flat band. This section would tend to increase the life of the band, but any need of this kind is fully provided by coating the wire with asphalt, by surrounding the asphalt with a woven coating and by covering the pipe after winding with another coat of asphalt. It would, indeed, be unusual abrasion that would reach these bands.

the coated wire does not project beyond the pipe. Consequently the wire is protected from any possible chance of mechanical injury and the binding wire cannot be dislodged.

So much for the binding of the pipe. The pipe itself is made of clear, kiln-dried fir staves free of sapwood. These staves have a finished thickness of 1½ in. After the pipe is wound it is sent to the heading machine, where a tenon is turned on one end and a mortise is reamed out at the other. By the exercise of due care a tight driving fit is assured.

The outer surface of the section of pipe is next dipped in hot asphalt, which completely embeds the coated wire in its groove and also acts as a preservative to the staves. After rolling in sawdust a binder coating is added, which will not melt in the hottest summer sun. The coating of a length of treated pipe kept in a dry kiln for thirty days at a temperature around 180 deg. actually becomes harder under the severe test. The pipe will sustain heads from 100 to 400 ft. or even higher pressure. One 8-in. pipe has operated for five years under a head of 600 ft.



Problems of Operating Men

Edited by
James T. Beard



Measuring Voltage Drop on Rail or Feedwire

Locating Defective Rail-Bonding or Bad Joints in Feedwire—Resistance Employed to Regulate Current—Voltmeter Readings Taken at Regular Intervals on Entry

IN reading the excellent article of B. F. Grimm, published some time since in *Coal Age* (Aug. 25, p. 291), I note his reference to defective bonding and poor joints in feedwires, being a cause of frequent armature burnouts.

Mr. Grimm states the case in the following words: "A frequent cause of armature burnouts is low voltage as the result of inadequate track-bonding and poor joints in feeder wires." I heartily agree with him in this statement, which conforms to my own experience.

In that connection, I wish to submit a method that I have found useful in measuring the voltage drop on any given section of track, for the purpose of locating trouble in the rail-bonding, or bad joints in either the trolley wire or the transmission line.

For that purpose, the entire length of the system is first divided into equal

must be taken not to overheat or burn out the resistance.

In the figure, the trolley-wire switch is shown as closed, while the machine-feedwire switch remains open. The feedwire is connected with the rails, at the outby station marked A, by a temporary jumper.

The rails will, of course, be grounded at various points along the road, particularly if the mine is wet, and this grounding will be greater at some points than at others, owing to the varied conditions. This grounding of the rails, however, will have little if any effect on the voltmeter readings, which are to be taken at the various stations along the track.

In order to show how slight the effect of the grounding of the rails, we will suppose a voltmeter reading to be taken first at Station E. At that point the voltmeter is first connected in between

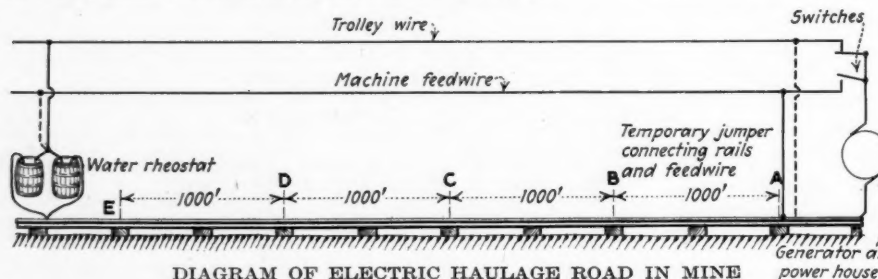


DIAGRAM OF ELECTRIC HAULAGE ROAD IN MINE

sections of, say one thousand feet in length, by the stations marked A, B, C, D, E, in the figure.

The method of procedure is as follows: A water rheostat or some other form of portable resistance, such as a locomotive with the brakes set, so as to draw a current of, say 200 amp., is installed at the inby end of the system.

At this point, an ammeter reading is taken, which will tell the exact amount of current flowing. In the figure, the trolley wire is shown as connected with the rails at the inby end, while the outby end of the track rails is connected by a wire conductor with the generator in the powerhouse.

The use of a water rheostat, in a close place, may be objectionable owing to the gases produced. Unless the place is well ventilated, the gas set free at the rheostat may prove dangerous. If a locomotive is used with brakes set care

the trolley wire and the rail. Its reading will then show the combined drop on the trolley wire and the rail. Here, we find that the trolley wire is electrically positive as compared with the rail.

Another reading is now taken, at the same point, with the voltmeter connected in between the rail and the machine feedwire. This reading is found to be somewhat less than that first taken. It shows the total drop on the rail, from Station E to Station A, where the jumper connects the feedwire with the rail. This second reading shows that the rail is electrically positive as compared with the feedwire.

These facts together with the fact that the ground will carry all the current that this small voltage drop can push through it, between points where the rail may be grounded, shows clearly that the voltmeter readings taken at

the several stations along the track will not be affected.

In other words, we are determining the condition of the return circuit which, in this case, consists of the bonded rail and the ground combined; but all the current will eventually return to the rail, before reaching the wire connection to the generator.

Assuming that we know about what voltage we should have, per thousand feet of track, with a given current flowing and the bonding in good shape, it is clear that the successive readings, taken at stations from E to A, will show in what section the most trouble lies.

It is not claimed that this method will locate any one bad bond, but merely that it will show the general condition of the bonding in each respective section of the track. There is no way of which I know that will determine the exact condition of each bond, without reading each bond separately with a bond tester.

It is clear, however, that this plan of proceeding will very much reduce the work of locating serious trouble in the system. When a particular section has been found to be defective or below par in effective transmission, the trouble can be run down quickly by taking intermediate readings at different points of that section. The voltmeter used should be a low-reading instrument.

It is evident that, in order to make a similar test of the trolley wire, it is only necessary to connect the temporary jumper, at Station A, with the trolley wire, as shown by the dotted line in the figure. Then open the trolley-wire switch and close the machine-feedwire switch. At the same time, the inby end of the machine feedwire is connected with the rails through the water rheostat, as indicated by the dotted line, thus leaving the trolley wire dead in this case. The voltmeter readings are then taken between the rail and the trolley wire, at each successive station, until the trouble is located.

Hillside, Ky. F. C. SINBACK.

Speed of Fan at Firing Time

Speed of fan at firing time regulated by conditions in the mine—Small mine, thin coal may require speed reduced—Old mine, thick coal, speed increased.

REFERRING to the Examination Questions answered in *Coal Age*, Dec. 22, p. 1017, kindly permit me to offer a few comments, by way of expanding on the excellent reply given to the first question on that page. The question asks whether the fan ventilat-

ing a mine should be run at normal speed or slowed down, at firing time.

The reply to this question has very properly mentioned the almost universal practice of running a fan at its normal speed, at the time of firing shots in the mine, stating also that in some cases the fan is run at an increased speed at that time.

What interested me the most, however, was the further reference to possible conditions that may require the speed of the fan to be regulated accordingly. It is this point that I wish to emphasize and illustrate by giving one or two concrete examples.

CONDITIONS IN A NEW MINE MAY REQUIRE SLOWING OF FAN

First, let us assume that Dick has charge of a mine working a seam of coal varying from 40 to 48 inches, in thickness, and overlaid with a hard sandstone roof. The mine is practically a new one, the length of the main heading not exceeding, say 4,000 ft. The mine is dry and there is much dust accumulated in the workings, the coal being blasted off the solid.

We will say that the mine is ventilated by a 6-ft. blowing fan, producing 12,000 cu.ft. of air per minute. From the description given, it is quite evident that this new mine affords no room for the expansion of the hot gases caused by windy shots, which are liable to occur in the blasting of the coal.

Under such conditions, no one will deny that a windy or a blownout shot will throw much fine dust into suspension in the air. The question that now presents itself to the practical mind is, shall we keep the fan running at its normal speed, under these conditions; or shall we slow down the fan to, say one-third of its normal speed. My judgment is in favor of the latter.

SPEEDING THE FAN WHEN FIRING IN A LARGE GASEOUS MINE

Again, let us assume that Tom has charge of a larger mine that is fully developed and, perhaps, the workings are so extensive as to require booster fans, at different points in the mine. We will say that the circulation in this mine is 50,000 cu.ft. of air per minute.

Consider, for a moment, the conditions that must exist in these extensive workings. Our experience tells us that the air becomes warm, almost to a degree that is unbearable. In addition, we will assume that the mine is generating gas and, like the one first mentioned, contains accumulations of dust due to blasting the coal off the solid.

Here, again, the question is asked, shall we keep the fan running at its normal speed, at a time when shots are fired in the mine; or shall we increase the speed of the fan, in this case, with a view to cooling the air passing through the workings and, by increasing its velocity, give it more power to sweep away the gases produced by the firing of so large a number of shots throughout the mine.

In this instance, my plan would be first to sprinkle or spray the dust,

avoid any excessive accumulations at the working faces and inspect each place, making careful tests for gas before firing any shots therein. In addition to these precautions, I would increase the speed of the fan, for the reason previously mentioned. This is one of the most interesting questions that has been presented for some time and I hope to hear the views of others giving their practice and preference.

Crawford, Tenn. OSCAR H. JONES.

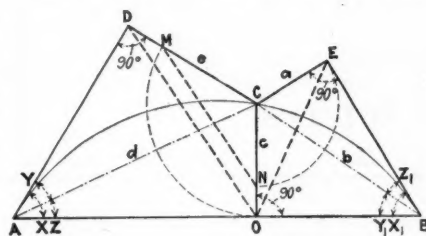
Problem in Geometry

Solution depends on a single principle, which is a property of the circle—Angle between chord and tangent measured by half the subtended arc.

REFERRING to the unfinished problem appearing in *Coal Age*, Feb. 23, p. 334, which space did not permit being completed, we had hoped that some interested reader would furnish the correct solution.

However, none of the answers received up to this time are either correct or simple. It was desired to show that an ordinate at any point of the chord of an arc of a circle is a mean proportional between the two perpendiculars drawn from the end of the ordinate to the respective tangents to the circle, at the two extremities of the chord. The solution is as follows:

Referring to the accompanying figure, which is identical with that on page



334, with the addition of the two sub-chords AC and BC, we have designated the several angles involved, by XYZ and $X_1Y_1Z_1$; and the sides of the triangles by a, b, c, d, e .

The solution depends on a single principle, which is a property of the circle; namely, the angle between the chord of a circular arc and the tangent to the circle, at one extremity of the chord, is measured by half the subtended arc.

APPLYING THE PRINCIPLE

Applying this principle and referring to the figure, the angles X and X_1 are each measured by half the arc ACB ; and the angle Y is measured by half the arc AC ; and the angle Z_1 by half the arc BC .

But, the angle Z , being the difference between the angle X and Y , is also measured by half the arc BC , which is the difference between the arcs ACB and AC . Hence, the angles Z and Z_1 are equal, each to each. Likewise, the angles Y and Y_1 are equal, each to each.

Now, in the right triangles AOC and BEC , the angles Z and Z_1 being equal,

the triangles have all their angles equal, each to each, and are therefore similar and their corresponding sides are proportional; thus,

$$a : b :: c : d \quad 1.$$

$$\text{Or, } a : c :: b : d \quad 2.$$

Again, in the right triangles BOC and ADC , the angles Y and Y_1 being equal, all the angles are equal, each to each, and the triangles similar, making their corresponding sides proportional; thus,

$$c : b :: e : d \quad 3.$$

$$\text{Or, } c : e :: b : d \quad 4.$$

But, the second couplet of the proportions 2 and 4 being identical, their first couplets will form a proportion; thus,

$$a : c :: c : e \quad 5.$$

which shows the ordinate c is a mean proportional between the two perpendiculars a and e , drawn from the end of the ordinate to their respective tangents, which was to be proved.

Finally, since, a is equal to CN ; and e to CD ; and c equals both CO and CM , we can write from the last proportion:

$$CN : CO :: CM : CD$$

Which makes the two triangles CNM and COD similar triangles, having their corresponding sides proportional and their corresponding angles equal each to each. Therefore, the line MN is parallel to the line DO .

New York City.

J. T. B.

When It Is Safer to Seal Off Abandoned Areas

Conditions that make it unsafe to ventilate abandoned places—Tests show air behind seal non-explosive, owing to lack of oxygen—Seals must be well built and care taken not to break into the sealed sections.

WHETHER a worked-out and abandoned section in a mine should be sealed or ventilated, to afford the greater degree of safety, has held the attention of numbers of readers of *Coal Age*, recently. No doubt the conditions that prevail underground will vary judgment in this regard, in many cases.

One writer in the issue, Feb. 2, p. 210, expresses himself as being strongly in favor of ventilating all abandoned areas, claiming that the practice of building seals to close off such places is highly dangerous, because of the more rapid generation of gases within the area, by reason of the natural rise of temperature when the circulation of air is cut off.

MINES IN WHICH ABANDONED AREAS ARE SAFER WHEN SEALED

That writer may be surprised to learn that there are conditions under which the ventilating of large abandoned areas would be decidedly unsafe. In support of this statement, allow me to cite a few instances in the practice of coal mining in this state.

The American mine No. 1, Indian Creek and Bruceville mines, all working No.-5 coal, in Indiana, are subject to conditions that require the sealing

off of those sections of the mine that are worked out and abandoned. It would be unsafe, if not impossible, to work any of these mines with safety if the old works had to be ventilated and remain open.

The conditions are such that the roof caves badly and sets free enormous quantities of gas that accumulates on the falls. To attempt to ventilate large areas subject to these conditions would only result in failure and disaster.

GENERAL INDIANA PRACTICE

Instead of this, the general practice in Indiana, has been to seal off the old panels as quickly as they are finished. If this was not done and the places were allowed to remain open the entrance of fresh air would render the gas accumulated on the falls highly explosive.

The writer to whom I have referred speaks of the possibility of gas being ignited by a fall of rock striking sparks. That would be just what would happen in these mines were the abandoned areas to be left open, allowing the entrance of fresh air.

On the other hand, the sealing off of such areas makes such an occurrence impossible. Numerous tests made of the air issuing from the pipes built in the stoppings show that the oxygen has been practically exhausted in a short time after the seals were built.

At the time a seal is first closed the air inside is the same as that outside of the seal; but, as time passes, tests made of the air show the presence of methane, carbon dioxide and carbon monoxide, with gradually decreasing percentage of oxygen, which has been consumed by the various reactions due to slow combustion taking place in various forms within the area.

In my opinion, under the conditions I have mentioned, there is more safety in the building of good seals than would be possible to attain by any amount of ventilation of these abandoned areas, because of the difficulty of sweeping to slow combustion taking place in the places clear.

It should be understood that the gas, in these mines, comes down and can be detected within five or six feet of the top of the coal, and is highly explosive for eight or ten feet above that, while pure gas fills the cavity above.

The sandrock or "steel band," as it is called, lies about 5 ft. above No. 5 coal. The falling of this rock affords every liability of gas being ignited by the sparks struck when the rock falls, provided air is present in sufficient quantity to make the mixture explosive.

Another point of less importance, however, is that the sealing off of these places when finished reduces the friction and decreases the mine resistance.

Wheatland, Ind. ALBERT RICKETS.

tractive effort, as determined by the adhesion of the wheels to the rails, in pounds, and the speed of the train, in feet per minute.

Just here, it is well to remind this student that the tractive effort determined by the adhesion of the wheels of the locomotive to the rails is a factor of the weight of the machine resting on the drivers, which, in a four-wheel locomotive, is the entire weight of the machine. It is safe practice to assume the tractive effort of a mine locomotive as one-fifth of the weight resting on the drivers, provided the rails are clean and dry and the track in good condition. The kind of tires and the condition of the rails, whether wet or dry, greasy or sanded, will vary this factor of adhesion, which may range, perhaps, from 10 to 30 per cent of the weight on the drivers.

2. The maximum speed of a locomotive hauling a train on a level track is plainly dependent on the load hauled. Under full load, or when the locomotive is hauling to its full capacity, the speed will not much exceed the speed rating of 8 miles per hour. When hauling a lesser load the speed of the train will vary inversely as the load.

3. A 20-ton locomotive operated on a good track is estimated to develop a tractive effort of $(20 \times 2,000) \div 5 = 8,000$ lb. Then, assuming the cars are mounted on roller bearings and in good condition, giving a track resistance of, say 10 lb. per ton, the weight of the train, including locomotive and cars hauled per trip, will be $8,000 \div 10 = 800$ tons.

This load, including the weight of the machine, a properly designed locomotive should be able to haul, on a level track, at a speed of 8 miles per hour. But, since the speed varies inversely as the load, the same locomotive should haul one-fifth of this load or 160 tons, at a speed of 40 miles per hour, approximately.

4. Assuming an average 5 per cent grade, in favor of the loads, the track resistance, in pounds per ton of moving load, will be reduced $0.05 \times 2,000 = 100$ lb. per ton when on the down grade. According to the style of equipment, whether plain or roller bearing, the track resistance may vary from 10 to 30 or even 40 lb. per ton of moving load. We will assume, here, an average mine equipment, giving a track resistance of, say 20 lb. per ton. In that case, the 5 per cent grade factor being in favor of the loaded cars, the entire train will gravitate under a force of $100 - 20 = 80$ lb. per ton.

Then, since 20 lb. per ton develops a speed of 8 miles per hour, in moving this train, and since the velocity moving a given mass varies as the square root of the force applied, the speed produced, by a moving force of 80 lb. per ton, will be $\sqrt{4} \times 8 = 16$ miles per hour. In this case, when the train is descending the 5 per cent grade, under the assumed conditions, the power of the motor will not be utilized but the train will gravitate at the speed mentioned, approximately.

Inquiries Of General Interest

Speed in Locomotive Haulage in Mines

Mine Locomotives, General Speed Rating 8 Miles per Hour, Maximum Load—Power to Drive Machine Determined by Tractive Effort and Speed Under Full Load
—Tractive Effort Estimated from Weight on Drivers

ALTHOUGH some of the questions I am about to ask may seem foolish it is for the sake of settling an argument that we desire to have them answered in *Coal Age*. This favor will be greatly appreciated by a few of us, who have been debating the subject and have not been able to come to any agreement. The questions are the following:

1. What is the rated or geared speed of a mine locomotive, say a machine weighing 10, 12 15 or 20 tons? 2. What is the maximum speed of said locomotive on a level track? 3. Can a 20-ton motor be operated at 40 miles an hour? 4. Assuming a 4 to 6 per cent grade, in favor of the loads, what would be the speed of the trip when the motor is hauling a load to its full capacity; or, in other words, using its full power?

State College, Pa. MINING STUDENT.

We will answer these questions in the order they are asked, giving the

information that we believe is most desired.

1. A quite common practice, in the manufacture of mine locomotives, is to design the motor driving the machine so as to enable it to haul a full load at a speed of 8 miles per hour. By "full load" is meant the hauling capacity of the machine. When hauling such a load, the motor is using, perhaps, about two-thirds of the power for which it was designed, since it is always well to have a surplus of power, in the motor, that will enable it to meet all exigencies.

Whether the locomotive is direct acting or geared will have no effect on the tractive effort the machine can exert and which is applicable to moving the entire trip including the locomotive and its train. As is well known, the effective power of the motor, after allowing for the internal resistance in the machine, is the product of the

Examination Questions Answered

Alabama Second-Class Examination, Birmingham, July 23-28, 1922

(Selected Questions)

QUESTION—What are the causes of falls of roof and how would you make an inspection to determine the security of a roof in a mine?

ANSWER—Falls of roof result from insufficient timbering, or an improper mode of timbering the entries and working faces in the mine. A fall may result from the failure to set posts where and when needed. Too rapid extraction of the coal over a large area with insufficient pillar support will generally develop a creep or squeeze, followed by heavy falls of roof.

When inspecting a mine to determine the security of the roof, each working face must be carefully examined to discover any possible slips in the roof, or other faulty strata. Attention must be given to the manner in which each place is timbered. A systematic method of timbering, adapted to the particular conditions in a place, will insure the greatest degree of safety. Too much reliance must not be placed on sounding the roof with a pick or hammer. When sounding a roof the left hand should be held against the roof as the blow is struck, as a means of detecting more certainly its condition. All working faces should be inspected by competent persons, at frequent intervals, while the men are at work in their places.

QUESTION—Describe how you would construct a good, cheap and durable brattice, in breakthroughs on entries and in rooms.

ANSWER—A cheap, but good and durable form of stopping, for breakthroughs on entries, consists in building a double wall of slate or rock in the opening and filling the space between the two walls with dirt taken from the road, or sand where that is obtainable. The work must be carried up to the roof and all cracks and crevices plastered with clay. Room stoppings require less care in building than those on entries, but are built in much the same manner.

QUESTION—Name and describe the different haulage systems with which you have had experience and state the conditions to which each is best adapted.

ANSWER—The two general types of mine haulage are animal haulage, by mules or horses, and mechanical haulage, by means of ropes and cables, or by locomotives driven by electricity or compressed air. Mule haulage is adapted to short hauls in a newly opened mine and gathering hauls, at the working faces of larger mines, for

the purpose of collecting the cars loaded by the miners and assembling them at partings, to be hauled out of the mine in trips. The empty cars are distributed to the working faces by the same means.

Rope haulage includes gravity-plane haulage on inclines where the descending loaded cars pull the empties up the plane; and engine-plane haulage where the cars are raised and lowered by a winding engine located at the top or bottom of the plane. Another form of rope haulage is that known as "main-and-tail-rope haulage." The main rope is attached to the head end of the loaded trip, which it hauls out of the mine, as it winds on the drum of the engine on the surface or at the shaft bottom. At the same time, the tail rope unwinds from the drum and passes from the engine to a tail sheave at the inby end of the haulage road where, after passing over the tail sheave, it is attached to the rear end of the trip. The tail rope also serves to check the speed of the loaded trip and to haul the empty trip back into the mine.

Still another form of rope haulage is that known as "endless-rope haulage," consisting of a single rope passing, from the winding drum of the engine, through the mine and over the tail sheave and returning again to the engine. This rope is run continuously, the cars being attached to the rope at regular intervals, both going out and returning into the mine.

Gravity-plane haulage is best adapted to steep inclines where the cars are moved by the action of gravity. Engine-plane haulage is used where the inclination of the plane is too steep to afford safe control of the moving trip. In engine-plane haulage the engine hauls the trip up the plane and the cars are returned to the bottom by gravity. Tail-rope haulage is best adapted to light variable grades, while endless-rope haulage is generally applied on long level roads.

Locomotive haulage is particularly adapted to handling large outputs on long hauls and winding roads, where rope haulage could not be employed to advantage. The choice between electric and compressed-air locomotives must depend on the mine equipment.

QUESTION—What is the general rule for timbering a room 30 ft. wide, with a tender roof?

ANSWER—The roof conditions should be carefully studied and a systematic

form of timbering adopted to suit those conditions. The posts should be set in rows parallel to the face of the coal. In general, two rows will suffice, but the posts in successive rows must be staggered. The posts are set at regular distances apart, which must be determined by the nature of the roof to be supported. Likewise, the distance of the first row from the coal face and the distance between the rows is determined by the character of the roof. As the coal face advances, the posts in the rear row are taken out and reset closer to the face.

QUESTION—If you found the air current was insufficient, how would you proceed to remedy the same without installing new machinery?

ANSWER—First, clean up all air-courses and remove every obstruction to the flow of air throughout the mine, enlarging all breakthroughs, in rooms, and crosscuts, in entries. Wherever practicable, shorten the distance the air must travel. Much advantage will be derived, also, by splitting the air current where this can be done without reducing the velocity, at the working faces, below what is required to keep the workings clear of gas. We assume that the fan is operating at a maximum safe speed.

QUESTION—What must be carefully considered before the work of drawing pillars is begun?

ANSWER—Before starting to draw pillars in a mine, the effect on both the surface and the adjoining workings in the mine must be carefully considered and whether it is possible to gain any advantage by carrying the face further, in that section. Regard must be had to keeping the line of pillarwork uniform, in a given section of the mine, in order to avoid causing excessive pressure on the ends of any one of the pillars more than on the others. Every possible precaution must be taken to avoid the danger that may be caused by the presence of water or gas in the roof strata. When once begun, the work of drawing pillars must be carried forward regularly and continuously, in order to obtain the best results. Only experienced miners should be employed in the work.

QUESTION—How can a mine foreman best gain and hold the respect of the workmen and always have his instructions carried out?

ANSWER—By establishing for himself a reputation for fairness and square dealing, and by taking care to instruct his men in a practical way, that they will realize that he has their best interest and welfare in mind, there will be little danger of a foreman losing the respect of his men, both for himself and for the orders and instructions given them. A foreman should never ask his men to take a risk he is unwilling to take himself; or expect them to perform work more quickly and better than he could do it himself. Men are quick to observe these qualities in a foreman and the orders and instructions of such a man are generally obeyed without question.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

IN THE past month or so business has shown some hesitation, but fluctuations in business activity are to be expected this year, and the slowing up presents no new aspect, according to the *Commerce Monthly* for March, being in part seasonal and in part the result of renewed caution in buying and in commitments for the future.

"Consumers continue to demand real values," the review continues, "and are confining purchases to actual necessities. Apparently special clearance sales have had but limited effect in stimulating demand, and as a result of the consumers' attitude, retailers and jobbers are disposed to be extremely cautious. Manufacturers are booking only a moderate volume of future orders notwithstanding light stocks in the hands of retailers. Labor adjustment in New England cotton mills and continued high cost of raw materials have been disturbing factors in woolen, worsted and silk manufacture, but no marked reduction has taken place in the operation of these or other major industries.

"The outlook continues to justify faith in gradual improvement in 1922. The experience of the closing months of 1921 will doubtless be repeated. Orders probably will be numerous, but for small amounts for prompt delivery, serving to keep production at a fairly satisfactory rate in most staple lines. Operations under these circumstances will be difficult, but sounder trade and labor conditions will certainly result.

"The outstanding fact in the world today is the economic strength and soundness of the United States. This is strikingly evidenced by the character of the statements for 1921 made by many firms and corporations. While the results for the year reflect losses so large that even those most intimately in touch with both the broad and the detailed aspects of these businesses were hardly prepared for them, reductions in working capital and in surplus accounts have paradoxically left most firms and corporations in a sounder financial situation than for many years. The sharp reduction in liabilities against even reduced assets has left room for healthy growth and development, where in the past in many cases this was not possible.

"The results of business depressions are by no means wholly evil. Easy profits result in inefficient and careless business habits and in individual and corporate extravagance. Hard times compel efficiency and thrift."

Roads Place Large Steel Orders

The Pennsylvania R. R. is reported to have placed one of the largest orders for accessories in years, comprising 400,000 lb. of track spikes, from 100,000 to 200,000 tie plates and 100,000 heat treated track bolts.

The Illinois Steel Co. has contracted to supply 2,000 tons of rails to the Minneapolis, St. Paul & Sault Ste. Marie Ry. The Buffalo, Rochester & Pittsburgh and the Hocking Valley also are reported to be large buyers of accessories. They recently purchased 5,000 and 3,000 tons of rails, respectively, from the Lackawanna Steel Co.

An increased demand for steel products is more plainly indicated, but throughout the trade great care is taken lest its extent be overstated, according to the *Iron Age*, which says:

"Operations continue at the higher rate shown by February statistics. For the Steel Corporation they are slightly under 60 per cent this week, and for the whole industry are probably between 55 and 60 per cent. Buyers and sellers are watching closely for developments in three directions—the coal strike, spring demand, and the effort of the steel companies to advance prices on plates, shapes and bars."

Car Loadings Gain 67,969 in Week

Cars loaded with revenue freight during the week of March 4 totalled 803,255, compared with 735,286 in the week ended Feb. 25, according to the American Railway Association. This was principally due to heavier traffic in merchandise and miscellaneous freight, which includes manufactured products, and also coal. The total shows an increase of 91,888 over the same week last year. However, loadings were the largest for any week since Nov. 5, 1921, when the total was 829,522 cars.

Fewer Idle in Pennsylvania

The number of workers idle throughout the State of Pennsylvania showed a decrease of about 5,000 during February, according to the semi-monthly bulletin of the State Department of Labor and Industry, recently issued. The unemployed on March 1 numbered 308,450, as compared to 313,835 on Feb. 1.

Georgia Cotton Mill Expands

The Eatonton Cotton Mills, Eatonton, Ga., which manufacture sheetings, etc., are improving and enlarging the plant. Approximately 20,000 square feet will be added.

To Erect Tire Fabric Mill

The Thistle Cotton Mills, makers of tire fabric and yarns is about to erect a mill building at Ilchester, Md., in the near future. W. L. Rouse and L. A. Goldberg, New York architects are preparing the plans.

Predicts Prosperity in South

W. H. Kettig, chairman of the Birmingham branch of the Sixth Federal Reserve Bank, sees better times ahead for the South, as a result of the increased price of agricultural products including grains, hogs and cotton, according to the *Dry Goods Economist*.

"The advance in the price of agricultural products," he says, "puts the farmer, particularly in the West, in a much better position financially. It helps his purchasing power, and this in turn is an aid to the general business situation.

"The prosperity of the West will create a demand for Southern products and thus this section will feel the benefits." He points to the advance in foreign exchange as another good sign, certain to help the purchasing power of Europe and create a better demand for agricultural products.

Mr. Kettig sounded a note of warning against expectation of a boom, and declared that anyone looking for another period of inflation would be disappointed.

Chronology of Controversies as to Wages Since Jan. 1, 1922

- JAN. 4.—Conference of United Mine Workers of America with the operators of the Central Competitive Field called off by John L. Lewis.
- JAN. 10.—Nova Scotia Court of Appeals suspends injunction of Judge Russell restraining British Empire Steel Co. from making a new wage scale to replace that which had expired.
- JAN. 13.—After three days' parley, union and operators in Georges Creek and Upper Potomac region adjourn indefinitely meeting to discuss wage scale.
- JAN. 14.—Jackson County Circuit Court of Missouri refuses to make permanent a temporary restraining order preventing the ousting of Alexander Howat as president of the Kansas district in the United Mine Workers of America.
- JAN. 17.—Secretary of Labor Davis telegraphs Governor Edward Morgan of West Virginia asking him to stay the evictions of mine workers in New River field scheduled for Jan. 18.
United Mine Workers of three anthracite districts meet in Shamokin.
John L. Lewis, president of the United Mine Workers of America, made a statement declaring that no wage reductions would be permitted.
- JAN. 28.—Pittsburgh Coal Producers' Association and the southern Ohio operators post scale for mine workers, effective April 1.
- FEB. 1.—John L. Lewis, president, United Mine Workers, writes to the sixteen major railroad organizations requesting a meeting to discuss combined action against wage reductions.
- FEB. 4.—Scotts Run operators announce 30-per cent reduction in wage, effective April 1, and abolition of check-off.
- FEB. 6.—Alexander Howat, released from jail on bond appeal, declares his purpose is merely to defend his case before the Indianapolis convention, meeting on Feb. 14.
- FEB. 9.—Samuel Gompers, president of the American Federation of Labor, announces that the "American labor movement and the American people will be with the miners if they are forced to fight to defend their rights."
- FEB. 10.—Mine workers of British Empire Steel Corporation in referendum reject the Gillen arbitration award by 6,054 votes to 224.
- FEB. 14.—United Mine Workers of America meets in special conference at Indianapolis and wage scale committee reports in favor of maintaining present wage scales in the bituminous region and increasing anthracite scale as provided at Shamokin conference, establishing eight hours from bank to bank and removing inequitable differentials in and between districts.
- FEB. 15.—Mine workers' conference votes open ballot in favor of reinstatement of Alexander Howat as president of Kansas district and of his followers as union men in good standing. This was reversed on secret ballot later.
- FEB. 18.—United Mine Workers of America adjourns, having narrowly escaped the repudiation of its national officers and having declared for short day and short week and for a 20 per cent increase in the anthracite region, an unchanged wage scale elsewhere and penalization for overtime and Sunday work.
- FEB. 21.—John L. Lewis invites bituminous operators a second time to meet in a wage conference.—Illinois operators express themselves as willing at any time to join conference with other members of the Central Competitive region and with the representatives of the mine workers of that region.
- FEB. 22.—Pittsburgh Coal Producers' Association and southern Ohio coal operators decline to accept President Lewis' second request for a conference between operators and the union.—Mine and rail workers at Chicago effect an alliance of chief executives with instructions to assemble a full conference if deemed necessary, this agreement to be operative only if ratified by constitutional authorities of unions of the alliance.
- FEB. 23.—Pittsburgh Vein Operators' Association, of eastern Ohio, refuse to take part in the conference of the Central Competitive region.—Truro conference of Nova Scotia mine workers meets to discuss Gillen arbitration award and votes on Feb. 25 to reopen direct negotiations with the British Empire Steel Corporation.
- FEB. 24.—Kanawha operators serve notice that if the union will not meet Kanawha operators before March 11 a new wage scale will be posted, the operators declare for the open shop and check-off and refuse to discuss latter.—President Harding, receiving newspaper men, stated that he had requested Secretary of Labor Davis to investigate whether there was not some way in which the mine workers and operators of the Central Co-operative Field could be brought into conference in accord with terms of wage contract.
- FEB. 25.—Anthracite operators agree to a conference with the union.
- MAR. 1.—Conference between representatives of United Mine Workers and British Empire Steel Corporation at Montreal results in tentative agreement.
- MAR. 3.—Frank H. Farrington, district president of the United Mine Workers of America in Illinois, announces that his state organization will meet the Illinois operators. John L. Lewis declares that under the policy declared by the United Mine Workers no single-state settlements can be made.
- MAR. 4.—J. B. McLachlan, secretary and treasurer of the Nova Scotia Mine Workers, and two district board members refuse to sign a letter advising mine workers to accept wage offer made by British Empire Steel Corporation, said to be a 20 per cent reduction instead of one of 25 per cent as under Gillen award and of 35 per cent as asked by company.
Western Mine Operators Association of Southern Alberta and Eastern British Columbia meets at Calgary, Alta., with mine workers of District No. 16 and disagree. Operators declare they will enforce their scale, which provides 30 to 50 per cent reductions.
- MAR. 6.—Unions start voting on proposition to declare a strike April 1, if settlement is not made prior to that time. Voting will be continued till March 9. Unofficial returns said to favor strike overwhelmingly.
- MAR. 7.—Representative Newton of Minnesota declares in House of Representatives that operators and owners of anthracite mines "are almost altogether responsible for excessive costs" and says "anthracite is worst run basic industry today."
Announcement made after Cabinet meeting that Harding administration would insist on coal operators discussing the wage scale with their employees.
- MAR. 8.—Railroad-miner defensive alliance ratified by International executive board of United Mine Workers of America.
- MAR. 13.—U. S. Supreme Court dismisses writs of error by which Alexander Howat and other Kansas Mine Workers officials sought a review of the decision of the Kansas state courts that found them guilty of contempt of court for refusing to appear before the Court of Industrial Relations.
C. Frank Kenney, president, District No. 17, tells Northern West Virginia Coal Operators Association, in conference at Baltimore, Md., with Mine Workers, that he is without authority to negotiate a scale until after meeting of the organization at Charleston, W. Va., March 21.
- MAR. 15.—Anthracite operators and Mine Workers meet in New York City to make biennial agreement.
Federal Council of Churches of Christ in America and National Catholic Welfare Council call on bituminous operators to fulfill "pledge of honor" to meet with mine workers "in a supreme effort to avert strike."
- MAR. 16.—Announcement made that Mine Workers of British Empire Steel Corporation by a vote of 7 to 1 rejected wage scale made by conference of Mine Workers' representatives and corporation officials, amending Gillen award.
James J. Davis, Secretary of Labor, in a speech in New York before women's department of the National Civic Federation calls coal mining a "dark industry" and adds that "it is filled with many dark secrets on both sides."
Kanawha operators postpone posting of new wage scale till March 30.

J. B. Reimer Decries Government Direction Of Private Enterprises

JOHN B. REIMER, of Queens Borough, New York City, who spoke on "Governmental Regulation" at the morning session of the regional meeting of the New York State Coal Merchants' Association, held at the Pennsylvania Hotel, New York City, on March 2, said that outside of strictly legitimate public functions there is nothing which the government can do which private management cannot do better.

Speaking of anthracite, he referred to the large company producers as compared with the independents and stated as his belief that the entire system of independent operation has not functioned properly during the past four years. Mr. Reimer asserted that the independents have taken advantage of every market condition which might add to their temporary advantage, financial and otherwise, thereby throwing the entire trade into discredit and ill-repute. It is inherent, he said, in the entire system of independent

operation to continue this method unless the system is controlled by an organization or association within itself, to whom it will delegate or assign restrictive powers or unless it is controlled by an outside authority.

Mr. Reimer said the unfortunate part of the situation is that laws cannot be made which will discriminate and regulate 30 per cent of the trade without making those laws applicable to the other 70 per cent. It may be possible that economic conditions, such as a period of lessened profit or continued loss, would concentrate the holdings of smaller operators in the hands of stronger and larger interests. Or it may be possible that pre-war arrangements will be revived, allowing the companies to again enter into the 65 per cent contract with independent operators. The public has objected to this form of alleged monopoly, but has not yet learned that seven big hogs can be controlled and have more sense than fifty-seven little ones all of whom have a voracious appetite and an ambition to grow fat.

Mr. Reimer believes that public opinion will ultimately fasten some form of regulation upon the anthracite industry

and contends that it needs certain forms of regulation. The first of these is that there must be a universal standard of preparation; second, a standardization of sizes; third, an elimination of wash sales and a fixing of commissions as between jobbers; fourth, a reweighing of coal cars at certain destinations or receiving points; fifth, equitable distribution in times of stringency based on previous years' tonnages, and sixth, the establishment of a bureau by the Federal Trade Commission for the collection of statistics, facts and costs of all the elements which enter into the mining, transportation and marketing of anthracite. Such a bureau would have to have authority to get whatever information it needed and not merely be the recipient of whatever information was voluntarily submitted.

Mr. Reimer said that so far as a retail trade is concerned,

it needs education more than regulation—education in regard to costs, overhead, co-operation with its competitors; pooling of interests as regards the various forms of insurance; adoption of uniform systems, methods, practices, credits and a full realization that cut prices never yet made more profits, increased the consumption of coal in any community, or drove a competitor out of business.

The meeting was attended by about 400 coal dealers. Other speakers included Warren A. Leonard, president, Leonard Coal Co.; Bruce Barton; Charles Dorrance, vice-president, Hudson Coal Co.; Charles G. Edwards, president, Real Estate Board of New York; Roderick Stephens, president, National Retail Coal Merchants' Association, and Joseph E. O'Toole, executive secretary, National Retail Coal Merchants Association.

Illinois Mine Workers' Earnings, Jan. 1-15

EARNINGS during the two-weeks period Jan. 1-15, 1922, of workers in 102 Illinois coal mines employing 38,070 men producing a tonnage of 1,256,693 are shown in the subjoined tables. This is approximately 27 per cent of the mines; 45 per cent of the miners and 45 per cent of the total tonnage of the state for the period here shown. The mines included in this showing are located in all parts of the state and operate in coal seams ranging in thickness from 36 in. to 9 ft. The data, from members of the Illinois

Coal Operators' Association, were compiled by F. C. Honnold.

There are three coal operators' associations in Illinois, operating a total of 373 shipping mines. The Illinois Coal Operators Association is the largest, having 179 mines, located in all parts of the state and producing normally about 58 per cent of the total tonnage of the state. The Coal Operators Association of the 5th and 9th District has 158 mines, all located within an average distance of 30-35 miles of East St. Louis, and produces about 31 per cent of the tonnage. The Central Illinois Coal Operators Association has 36 mines and produces about 11 per cent of the tonnage.

EARNINGS FOR TWO-WEEKS PERIOD, JANUARY, 1-15, 1922

	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Du Quoin	Southern Illinois Counties			State Totals and Averages
							Franklin	Williamson	Saline	
1. Number of mines.....	8	6	15	10	5	5	19	21	13	102
2. Av. work time (days)....	5	7.6	8.3	8.1	8.2	6	5.8	7.7	6.3	6.9
3. Tonnage.....	34,332	22,368	103,717	142,644	56,891	55,039	402,013	291,085	148,604	1,256,693
4. Total employees.....	2,852	607	3,170	3,686	1,708	1,743	12,236	7,229	4,839	38,070
5. Av. daily number all employees working at these mines.....	2,357	555	2,894	3,512	1,554	1,622	11,309	6,821	4,100	34,724
6. Number earning \$50 or more in 2-week pay period.....	406	382	2,047	2,790	1,390	852	6,697	5,357	2,297	22,218
7. Av. earnings Group 6 2-week period.....	\$75.79	\$74.97	\$81.21	\$81.57	\$76.10	\$71.72	\$79.47	\$83.98	\$79.39	\$79.36
8. Percentage (Group 6) to av. number working daily (Group 5).....	17.2%	68.9%	70.7%	79.4%	89.4%	52.5%	59.2%	78.5%	56%	63.9%
9. Percentage of total payroll paid to those making \$50 or over.....	34.3%	77.6%	80.9%	82.1%	90.1%	65.3%	75.7%	86.6%	73.8%	77.8%
10. Number of men on payroll in excess daily average working (excluding mine office)....	495	52	276	174	154	121	927	408	739	3,346
11. Percent absenteeism.....	17.3%	8.6%	8.7%	4.7%	9%	6.9%	7.6%	5.7%	15.3%	8.7%
12. Occupational deduction Per capita.....	\$451.68	\$777.35	\$10,023.48	\$5,783.84	\$2,995.23	\$2,628.01	\$15,130.01	\$17,347.75	\$4,297.70	\$59,435.05
13. Check-off for miners union dues and assessments.....	\$4,600.31	\$1,288.60	\$8,364.33	\$9,987.94	\$5,066.20	\$3,224.71	\$41,620.35	\$21,747.18	\$15,442.97	\$111,342.59
Per capita.....	1.639	2.125	2.671	2.771	2.989	1.881	3.473	3.085	2.38	2.985
14. Av. deductions per ton:										
Occupational.....	.013	.034	.096	.041	.053	.047	.038	.059	.028	.047
Union dues.....	.134	.057	.08	.07	.089	.058	.103	.074	.103	.088
Total.....	.147	.091	.176	.111	.142	.105	.141	.133	.131	.135

AVERAGE DAILY EARNINGS BY CLASSIFICATIONS

	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Du Quoin	Southern Illinois Counties			State Totals and Averages
							Franklin	Williamson	Saline	
Machine runners:										
Number of men.....		12	144	173	58	69	535	261	186	1,438
Av. earnings for the pay-period.....		\$70.24	\$94.79	\$90.51	\$70.56	\$68.46	\$86.77	\$136.31	\$92.10	\$96.04
Av. for days mines hoisted coal.....		14.05	12.47	10.90	8.71	8.35	14.46	17.69	14.62	13.92
Av. based on every working day in 2 week period (11 days)....		6.38	8.62	8.23	6.41	6.22	7.89	12.40	8.37	8.73
Loaders:										
Number of men.....	131	62	1,202	1,568	499	357	3,535	3,115	1,213	11,682
Av. earnings for the pay-period..	\$62.00	\$67.72	\$77.41	\$83.33	\$74.38	\$66.57	\$75.88	\$75.40	\$76.61	\$76.32
Av. for days mines hoisted coal.....	12.40	8.92	9.32	10.29	9.07	11.09	13.08	9.79	12.16	11.10
Av. based on every working day in 2 week period (11 days)....	5.64	6.16	7.04	7.57	6.76	6.05	6.90	6.86	6.97	6.96
Av. tonnage of loaders for days mine worked.....	4.2	7.5	7	9.1	7.7	9.1	11.4	9	10.3	9.1
Day men:										
Number of men.....	275	308	701	1,049	322	426	2,627	1,981	898	8,587
Av. earnings for the pay-period..	\$82.35	\$76.61	\$84.93	\$71.64	\$79.77	\$76.56	\$82.80	\$89.62	\$80.49	\$82.51
Av. for days mines hoisted coal.....	16.47	10.09	10.35	8.84	9.72	12.76	14.27	11.64	12.77	11.95
Av. based on every working day in 2 week period (11 days)....	7.48	6.97	7.72	6.51	7.25	6.96	7.53	8.15	7.31	7.50
Total (all classifications):										
Number of men.....	406	382	2,047	2,790	1,390	852	6,697	5,357	2,297	22,218
Number of mines.....	8	6	15	10	5	5	19	21	13	102
Av. days mines worked.....	5	7.6	8.3	8.1	8.2	6	5.8	7.7	6.3	6.9
Av. earnings for the pay-period..	\$75.79	\$74.97	\$81.21	\$81.57	\$76.10	\$71.72	\$79.47	\$83.98	\$79.39	\$79.36
Av. for days mines hoisted coal.....	15.16	9.86	9.78	10.07	9.28	11.95	13.70	10.91	12.60	11.50
Av. based on every working day in 2 week period (11 days)....	6.89	6.82	7.38	7.41	6.92	6.52	7.22	7.63	7.21	7.26

Government Not to Intervene in Coal Controversy Prior To April 1; Failure to Confer Helps Miners

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

THE fact that the country is on the eve of a great coal strike seems to be perturbing no one in Congress. The mail being received by Senators and Representatives, which accurately reflects the matters which are giving concern to the public, contains little reference to the coal situation. It is evident that the public refuses to be excited about the strike. It is believed that the strike can last two or three months, if distribution is well handled, before the pinch will become sufficiently acute to bring public pressure on Congress and on the administration in sufficient volume to induce these agencies to attempt to relieve the situation. When regulation of the industry was threatened, the coal trade made unqualified claims that it was able to take care of any crisis. In the situation now facing it the coal trade will have the best opportunity of its history to show that it can handle its own affairs, including the problem of distribution.

At the time of this writing there is no sign of intervention on the part of the administration. Secretary Davis is having a good deal to say, but it is the official business of the Department of Labor to make a show at mediation. Real intervention by the administration would be indicated

only when the President himself invited the representatives of the conflicting interests to confer. He is the only official whose invitation may not be declined. While the President has no legal power to compel the operators and miners to meet, custom has established the prerogative which makes his invitation tantamount to an order.

It is the consensus of opinion in Washington that the President is going to issue no such invitation prior to April 1. The circumstances surrounding the present situation are quite different from those in 1902, when President Roosevelt called the operators and the representatives of the miners into conference, and when President Wilson took similar action in the recent bituminous strike.

There is a growing belief, however, that the operators made a serious mistake in refusing to meet the miners in an interstate conference. What they have sacrificed in the way of public opinion is thought by some to more than offset any advantages that they may have gained by this refusal. In fact the only talking points the miners seem to have are the refusal of the operators to meet them in an interstate conference and the large profits alleged to be accruing to the anthracite operators.

Traffic Men Foresee 20 Per Cent Reduction in Coal Freights

Believe Large Increase in Traffic Will Be Sequel,
Citing Result of Cuts in Rates on Iron
and Steel and Oil

THERE is a general feeling among traffic men that the reduction in freight rates on coal may be as much as 20 per cent. This view is based largely on the unanimity of opinion as expressed at the rate-reduction hearing by witnesses representing most lines of industrial activity.

The Interstate Commerce Commission is now engaged in the onerous task of digesting the vast amount of evidence which was laid before it. Those who predicted that a decision would be forthcoming by April 1 are now willing to revise their estimate. It is not improbable that fully another month will be required by the commission to sift the evidence. There is a growing feeling that the railroads will do all they can to oppose the reductions which are likely to be ordered. This would mean at least that the thirty days' statutory notice would have to be given. In that connection it may be said that many believe that the railroads in their general attitude in this case have lost many friends, particularly by their objections to the appearance of shippers. When the railroads were turned back to the companies public opinion was with them to an extent never before attained in the history of railroads. Many think this asset has been largely frittered away.

The rate-reduction hearings continued for three months. More than a score of railroad lawyers from all sections of the country supported the railroad witnesses in their presentation of testimony intended to show that the railroads under no circumstances could stand a rate reduction at this time. Bankruptcy and receiverships were forecast for many of the carriers if rates were reduced. Nationally known railroad officials painted gloomy pictures intended to create the impression that the transportation machine is on the verge of collapse and that only one more stroke is required to paralyze it completely.

The railroads used 1921 as the basis of their calculations, which was the worst year in all railroad history. The carriers on a whole earned 3.3 per cent on their tentative valuations during 1921. They have admitted that the same ton-

nage handled in 1922 at the same rates and charges would earn 4.88 per cent. This allows for wage reductions already made, changes in working conditions authorized by the Railroad Labor Board, and the reduced cost of materials.

The railroads estimated the reduction in materials at 20 per cent. There is widespread belief, however, that the reduction was greater than that. In using the materials which were bought during peak prices railroad witnesses testified that they are being charged out on the high-cost basis. Shippers say that no other business in America is so protected or can fail to mark down invoices.

On the basis of probable costs in 1922 many are of the opinion that a return of 6 per cent could be made by the railroads if the tonnage were no greater than in 1921.

Throughout the hearing the railroads contended that reduced rates would not cause an increase in traffic. This was in the face of figures that rate reductions already had stimulated certain classes of traffic. Iron and steel export rates were reduced 25 per cent last August. An increase began at once in movement, which rose from 73,000 tons in August to 135,000 in December. Export rates on oil also were reduced. One large refinery in the mid-continent field had an increase ranging from 1,500 to 2,000 cars per month.

There is a quite general belief that the railroads are not willing to do their part of the deflating. Their labor costs have been reduced several hundred millions of dollars, but less than one-half of the saving accruing from that source has been translated into rate reductions. On the other hand, there is general faith in the Interstate Commerce Commission. Even though the transportation law has placed it in an embarrassing position by requiring it to act as guardian for the railroads, there is confidence that a decision in this important case will be an intelligent and equitable one.

Illinois Mine Hoists 7,214 Tons in a Day

THE world's record for a single day's output has been broken again. This time the Bell & Zoller Mine No. 1 at Ziegler, Ill., takes the palm. On March 9 the mine hoisted 7,214 tons. When this mine was sunk in 1903 by Joseph Leiter, top works were constructed of a size previously unheard of, for Mr. Leiter had taken a long look into the future and prophesied that within the life of those buildings that mine was going to be producing 5,000 tons a day.

See Prices Up Until Strike Is 90 Days Old; Then—

Nine Chicago Operators Only Thus Far in Agreement
Runaway Market Unlikely—"I Don't Know"
Is Customary Statement

"PRICES of coal during the coming strike? Well, if the strike runs past the 30-day mark, and it doubtless will, prices will take an upturn and keep on climbing until they double at the end of, say, 90 days. After that—"

If the ideas of nine coal operators in Chicago were trimmed down to only those few points on which they agree, and then put into words, the first paragraph of this article would be the result. The nine men—operators in various fields both east and west, running union as well as non-union mines—differ widely as to what should fill the blank at the end of that paragraph. They differ just as coal men are differing on almost every hazard they make nowadays. Practically the only statement they will agree upon from first word to last, day or night, Sunday and holidays not excepted, is: "I don't know." Casual visitors hear it. Customers asking for advice hear it. Even the coal men talking among themselves fall back upon it. Never was there such a period of "dumb-bellism" in the coal business.

It is pretty well agreed among coal men, however, even outside the nine operators here quoted, that prices must ascend during the coming summer until a general settlement with the miners on the wage question is effected. The ascent should not cause a runaway market—at least not during the first 90 days of the strike. After that—

EVIDENCES OF INDUSTRIAL REVIVAL SEEN

While demand is dead at this exact moment there are signs of a coming gentle revival to be noted in the middle Western region. The malleable iron industry all over this region is awakening after a long hibernation. A number of important railroad contracts for castings of various sorts have been let. Car builders are getting ready to handle some business that has fallen to them. There is a little steel business abroad in the locality around the lakes. Farm-machinery makers are beginning to feel the anticipated spring demand, now that the farmer is getting a better return on his grain, the automobile plants are feeling a faint urge and the brick and tile industry is fast coming to life for its summer run. So the Chicago coal men anticipate a thin trickle of demand for fuel during the spring which possibly might develop a little, though no freshet is in prospect.

With that slight freshening of demand evidencing itself probably soon after the strike takes effect April 1, it remains to be seen whether the non-union flow of coal from active mines will be heavy enough. Stocks on the docks and in the hands of railroads and large public utilities are considerable. They will absorb almost any shock that might—by some industrial miracle—register during April and early May. But if the entire union army of miners is still on strike by that time, it is expected in Chicago that a certain uneasiness among big consumers will begin to develop. With that prices on the coal coming out of West Virginia will start upward slowly.

Of course such demand as there may be will be for steam sizes during the summer. Domestic coals—if there are any on the market—will lag. As soon as that becomes evident, the producing mines will quit making domestic sizes. Then, as prices lift, nothing but mine-run coal will come west. Big consumers will crush it for their own use. Smaller consumers will take it until the price begins to get stiff. Then these will close down, lessening the demand probably enough to keep prices within sight; so say most of the nine operators.

But at the end of 90 days—"Then," said one coal man of 20 years' experience, "the top will blow off. It will be getting late in the summer and people who have to have coal will get excited. You know what that means. And I'm afraid that's what's going to happen." Some others scoffed at the idea. "Why!" they exclaim, rolling back in their

chairs, "this strike can't last 90 days. I should say not! Illinois miners are ready to make a deal out here any time, and it'll be made soon after the strike starts. That splits the union. Pfft! goes your strike."

"I'm afraid," soberly remarked an operator who has mines both union and non-union, and who came up through the ranks himself, "too many operators are forgetting an old principle of wise warfare and good business: 'Don't underestimate your opponent's strength.' Miners have a high regard for their union. In some localities unionism is almost a religion with them. Believe me, they won't consciously do anything that will smash their own organization. Even the Illinois miners will be a mighty hard bunch for Farrington or anybody else to lead into a separate agreement which will damage the union. Farrington may be willing to do it, and maybe he'll succeed, but I don't think so. Not if I know miners."

"When this strike starts, we're in for a long run of it. We may say: 'Oh, these fellows can't hold out long. They've no funds. They'll soon get hungry and then it's all over.' That's what a lot of operators thought in 1905. A strike started in the spring, when miners weren't supposed to have a quarter among them. It didn't end until the next fall. They fought for five months—on nothing. You know how they do it in these mining camps: Work a day or two at odd jobs, raise garden truck, get in debt to the store, pay a dollar or two and then get another ten dollars' worth of food, work another day or two on the roads or somewhere, get another extension of credit at the store, and so on."

"The storekeeper has to keep on giving more and more credit to a man for fear of losing what that man already owes him, and if he expects to stay in that town, he knows he has to carry those miners until they get back to work. A town can't let its people starve. So the miners can hold out until their towns are completely exhausted—and they'll do it if they think they're right. They'll hold out all summer in this strike if they believe the life of their union depends upon it."

So that particular operator is inclined to believe the country is in for a long drag of it—a drag long enough to have a decided effect on prices.

SOME MINES PRODUCE IN EXCESS OF SALES

Most Illinois operators are watching the others to see what effort, if any, is made to meet the strike period. Just now some mines are producing more than they are selling. This may be in anticipation of a last-minute rush of orders. If so, and if the rush does not develop, then such mines will shut down about March 22 or 23. If this production is going on in order to get a quantity of coal above ground before April 1, to be cashed in on later, that fact, too, will be evident in the final week's output compared with sales.

"I expect about 30,000 cars of Illinois coal will be on tracks unbilled the morning of April 1" guessed an operator. "Just how long it will stand there, or what price it will eventually bring, I couldn't even surmise. A lot of it will be held on a gamble and maybe the owners, after paying demurrage a long time, will dump it on the market at almost any price in order to get rid of it. On the other hand, demand may pick up and absorb it easily. If you asked me what the wise course is for operators my answer would be, frankly, I don't know."

The Illinois Coal Operators' Association has been silent, or nearly so, on the question of what prices may be during the strike. Here is its noncommittal comment: Coal prices will, of course, be affected directly by supply. It is believed non-union collieries can readily provide 3,500,000 to 4,000,000 tons per week; probably more if full car supply and adequate transportation is available. Such tonnage with reported stocks on hand should, judged by recent demand and arrival of spring weather, protect average requirements for some considerable period without distress to the public."

E. W. D.

COME, GENTLE SPRING!—With all the other bills coming in then, we hope we won't have to get some new Easter coal.—*Chicago Journal of Commerce.*

Finds Increase in Anthracite Wages Greater Than in Manufacturing Industries and on Railroads

EARNINGS of anthracite mine workers under the present agreement are from 152 to 166 per cent higher than before the war and have increased more than those of wage earners in manufacturing industries and on the railroads, according to an investigation just completed by the National Industrial Conference Board, 10 East Thirty-ninth Street, New York City. The board's canvass also revealed that the working hours and employment had remained fairly steady. The board has just announced the general results of its study of conditions in the anthracite industry.

"This investigation," it was said at the offices of the board, "is the most comprehensive study ever made of conditions in the anthracite industry. It covers fifty-five companies, with 94,514 wage earners, operating 179 collieries, of which the total production in 1920 was 64,548,928 tons, or about 91 per cent of the entire production of the industry. The period covered is from the last half of June, 1914, to the last half of October, 1921, and the results show conditions as to earnings, hours of work and employment in a representative period under the agreement of 1912-1916, as compared with a representative period under that of 1920-1921, which expires March 31, and the renewal of which the operators and workers have just met to discuss. The investigation covered the same companies during the entire period. All classes of wage earners in the industry are included except clerks and executives, contract miners' helpers and workers who missed more than two days of the full working time in any semi-monthly period.

"The investigation shows that the average hourly earnings of all wage earners were 27.8c. in June, 1914, and rose to 72.8c. in October, 1921, an increase of 162 per cent. Excluding contract miners, who are paid on a different basis from ordinary workers and whose earnings tend to swell the average, this increase is from 22.5c. to 59.9c., or 166 per cent. The average actual earnings of all wage earners in the semi-monthly period in the last half of June, 1914, were \$29.81, and rose to \$75.18 in October, 1921, an increase of 152 per cent. On this basis the weekly earnings of all wage earners rose from \$13.76 in 1914 to \$34.71 in October, 1921.

WORKING HOURS DECLINE ONLY SLIGHTLY

"During this period the average hours worked in a semi-monthly period for all wage earners declined from 107.4 to 103.3. Excluding contract miners, the decline was from 115.1 hours in 1914 to 111.9 hours in October, 1921. The total number of workers employed showed practically no change during the entire period. The number of breaker starts per colliery, which serves directly to indicate the amount of mine activity and therefore the opportunity for employment, were 11.6 in June, 1914, rose to 12.5 in June, 1921, and declined to 11.8 in October, 1921. In short, employment in the anthracite industry has been fairly regular throughout the entire period.

"Comparing changes in actual earnings with changes in cost of living during the period covered, the investigation shows that real hourly earnings of all wage earners in October, 1921, were 60 per cent above those in June, 1914. Excluding contract miners, the increase was 62 per cent during this period. Real weekly earnings in October, 1921, were 54 per cent higher than those in June, 1914.

"A comparison of the average actual hourly earnings in the anthracite industry with those of wage earners in manufacturing and on railroads, as set forth in previous reports of the Conference Board, shows that while actual hourly earnings of anthracite workers were lower than those of industrial and railroad workers in 1914 they were higher in 1921 than those of the other two groups. The percentage of increase in actual hourly earnings for industrial workers from July, 1914, to July, 1921, was 113 per cent; for railroad workers up to Oct. 1, 1921, 131 per cent, and for anthracite workers, 168 per cent. By July, 1921, the average weekly earnings of workers in manufacturing industries

were only 83 per cent above 1914, those in railroad work in October, 1921, 102 per cent, while in anthracite mining the increase was 152 per cent.

"The average actual hours worked per week by wage earners in manufacturing industries in 1914 were 51.3 as compared with 44 hours in July, 1921; those in the railroad industry were 59.7 in 1914 as compared with 52.2 in October, 1921; while the average hours per week for all workers excluding contract miners in the anthracite industry were 53.1 in 1914 and 51.7 hours in October, 1921.

"A comparison between representative periods from July, 1914, to October, 1921, shows that while employment has increased 21 per cent on the railroads, and declined 8 per cent in manufacturing industries, it has remained at practically the same level in anthracite coal mining.

"Up to October, 1921, real hourly earnings in the anthracite industry have increased 60 per cent, as compared with an increase of 41 per cent for railroad workers and of 32 per cent for industrial workers up to July, 1921. Real weekly earnings in the anthracite industry have increased 54 per cent as compared with 23 per cent for railroad workers and 13 per cent for workers in manufacturing industries generally.

PAY INCREASE TOPS OTHER INDUSTRIES

"In these comparisons the figures for workers in manufacturing industries go down only to July, 1921. Later data would make the contrast even more striking because of the continued decline in wages in manufacturing industries, while wages of anthracite workers, fixed under the 1920-22 agreement, have remained constant.

"The disproportionate increase in wages in the anthracite industry as compared with changes in manufacturing wages and railroad wages, is shown particularly when the changes in earnings of common outside labor in the anthracite industry are compared with those of common labor on class I railroads and with those of common or unskilled labor in manufacturing industries. The increase in hourly earnings of common labor in manufacturing industries from July, 1914, to July, 1921, was 117 per cent; from June, 1914, through October, 1921, those of railroad workers rose 138 per cent and those of outside common labor in anthracite mining 89 per cent. During these periods the increase in actual weekly earnings for common labor in manufacturing industries were 85 per cent for common labor on railroads, 99 per cent and for common outside labor in anthracite mining 189 per cent.

"Comparing these changes with changes in the cost of living during these periods, the real hourly earnings of common labor in manufacturing increased 34 per cent; on railroads, 45 per cent; in anthracite mining, 77 per cent. Real weekly earnings of common industrial labor increased 14 per cent; common railroad labor, 22 per cent, and common outside mining labor, 77 per cent.

"The average hours worked per week declined 8 hours for common industrial labor, 9.6 hours for common railroad labor, while those of common outside anthracite mining labor increased 0.2 hour."

In considering adjustments in the anthracite mining industry, the following factors must be taken into account:

- "1. The wage increases since 1914 have been very extensive.
- "2. There has been no wage reduction in the depression period.
- "3. The increases for surface labor have been far above those for underground workers in more hazardous occupations.
- "4. The increases have been greater for the unskilled worker and the day worker than for the skilled laborer and the man who works on a contract or tonnage basis.
- "5. The constant demand for anthracite as domestic fuel has maintained employment and hours of work at a practically uniform level."

Cost of Producing and Shipping Coal, Says McAuliffe, Must Come Down

IF the union bituminous and anthracite mines north of the Ohio and Potomac rivers close on April 1, the psychological effect on all industry will be other than beneficial, according to Eugene McAuliffe, in an address delivered March 1 before the Associated Engineering Societies of St. Louis. Outlining the elements that enter into the production of coal, Mr. McAuliffe stated what, in his opinion, were the salient features of the bituminous coal situation, as disclosed in part in the following paragraphs.

The cost of producing and transporting coal must come down. As the capital goods or savings invested in the industry are fixed in quantity, it remains for the directing force to get more out of the investment. To do this calls for an increased measure of efficiency in mine management; the problem offers difficulties, but they are not insurmountable. Much has been done in the way of installing larger units. The installation of mining machines, power haulage in place of animal haulage and the equipment that makes the mining and preparation of cleaner and better coal possible represent great strides toward betterment.

The loading of the coal at the face, which work now absorbs approximately 70 per cent of the total mining cost, must yield to mechanical loading machines, which are now loading lead ore in the southeastern Missouri lead belt for 15c. per ton. Such machines are being developed rapidly. They are in fact just around the turn and would be here now doing their part toward the amelioration of labor if it were not for the opposition of labor itself.

OPERATOR SHOULD CONTROL DRILLING AND FIRING

The drilling for and firing of explosives, a work now divided between hundreds of men in the larger producing mines, should be taken over by the operator, who could quickly develop a few skilled men who, equipped with portable power drills, would not only reduce the labor and cost of this feature of mine work but in addition, reduce the percentage of fine coal now made, improve the quality of all coal produced, and, further, add immeasurably to the safety of mine work. That 60 per cent of the men working underground handle, store and make use of high explosives as well as the sensitive fulminating caps employed to detonate them—these men frequently untrained, many of whom do not speak the English language—represents a condition that should not be allowed to continue.

One of the major responsibilities that attach to the owners of coal properties is that of building up an official mine staff which must be divorced from the working force. Unfortunately these men, usually honest, ambitious and industrious, frequently suffer not only from the tradition of years of work at the mine face but, due to the instability of the industry, hesitate to separate themselves permanently from the status of workmen, compelled as they are at times to go back to the ranks to obtain a livelihood. Broadly speaking, the mine staff or that portion which comes in immediate contact with the mine labor feels more closely related to it than it does to the capital investment.

The item of supplies, in Mr. McAuliffe's opinion, is one that must be studied carefully by all operating heads. Many large operations fail to maintain store supply accounts, simply charging to the current month's expense the invoice cost plus freight of each item billed for, regardless of the month in which it is used. The inside of a coal mine offers vicious opportunity for the waste of rails, fastenings (including spikes and bolts), copper, machine and motor supplies as well as timber.

Many of the items that bulk large in capital and operating costs have, like the union mine workers, refused to deflate their war and post-war prices. The makers of mine locomotives, mining machines and necessary repair parts are particular offenders. John Sherman years ago said "the way to resume is to resume"; likewise the way to deflate is to deflate. Every single interest that refuses to join in the work of deflation should be singled out and brought

into line. The cost of power, whether steam or electric, whether made or purchased, should receive special study and attention.

With 67.8 per cent of the cost of production paid for mine labor, that element of cost also must be revised, Mr. McAuliffe said. The officers of the United Mine Workers hold that this one industry must either insure full working time to all who gain foothold therein, regardless of the fluctuations in demand for coal made by the consumer, or otherwise pay a unit wage sufficiently high on such days that work is available (and the individual cares to work) to provide the standard of living they desire. There are today 150,000 men depending on the industry over and above those needed to supply the demand, an army equal to 30 per cent of the nation's mine working force. It would be just as reasonable to charge the railroads with the duty of maintaining on their payrolls the 446,550 laid off in that industry between September, 1920, and the same month of 1921 and to demand that the agricultural, steel, lumber, metal mining and general manufacturing industries carry the hundreds of thousands of men laid off by them at a time when, due to industrial depression, a market for the product of these men was unavailable.

There is nothing extraordinary in the attitude of the delegates who endorsed the impossible program of the 6-hour day and 5-day week; they are merely echoing the illogical teaching of their paid organizers, who find it pays them to use the vast sums which are collected at the source to in this way perpetuate their own positions. Until the system that underlies the conduct of this organization is "dry cleaned" and "pressed" it will remain impossible for a sane constructive leader to bring this army of men potentially sound, into a livable atmosphere.

The industry is a vital and fundamental one and its workers should receive good, fair wages, but the problem of caring for the fluctuations in volume of business between years of activity and depression is one that cannot be cured by excessively high wage rates. The wages paid mine workers today in the union fields run from 100 to 250 per cent above those paid in the non-union fields, the one representing an excessive wage that is strangling all industry, while the other extreme suggests a wage too low to maintain even the most conscientious worker—neither condition such as to best serve the nation's welfare. I have a definite feeling that unduly depressed wages are even less defensible than those which are inordinately inflated. Whenever wages are considered, the offense of voluntary absenteeism from work exceeding 10 per cent, which is common to the mine worker, must not be lost sight of.

STRESSES EVILS OF ABSENTEEISM

Mine workers as a class absolutely refuse to recognize their responsibility to the industry. Absenteeism represents a condition that has grown up gradually; it is an uncontrolled privilege suffered by no other industry. The first duty imposed on the mine staff after starting time in the morning is that of seeking substitutes for absent workers at what might be called "key" positions—motor-men, tripriders, machinemen, etc., who are essential to the creation and movement of the tonnage that the loaders place in the pit cars. This situation tends to reduce the day's output, increases the unit cost and multiplies the hazards that are attached to mining.

Under the contract the mine worker cannot be approached on the question of absenteeism providing he reports on alternate days on which the mine works; that is to say, if he is absent Monday, he may return Tuesday, absenting himself on Wednesday, and so on, this without even the formality of an excuse.

To this must be added the loss sustained from indifferent services rendered in certain important positions by leaders who resent being drafted for emergency service as motor-men, machinemen, etc. Further, and unlike any other form of unskilled labor, the loaders, who approximate 60 per cent of the mine force, begin leaving the mine at the end of the fifth hour, continuing to straggle out thereafter, so that it is probable that the working day of this class of labor does not average more than six and one-half hours.

The annual turnover due to the migratory and shifting habits of mine workers represents an economic loss in excess of that suffered by any other form of industry. There are some splendid men in our mines in Illinois; that is evidenced by the fact that approximately 35 per cent of the men on the payroll earn 50 to 75 per cent of the wages paid during each two-weeks period. This better element, however, is dominated and overrun by the irresponsible minority, who vociferously exploit the "rights of labor."

At the foundation of the abuses that surround the mine workers' union, Mr. McAuliffe stated, lies the much discussed check-off. Years ago certain operators agreed to collect at the source certain special assessments levied for sick benefit and funeral purposes. From this modest beginning the abuse has grown until the tax levied on mine workers, and through them on the consumers of coal, runs into millions of dollars annually. This tax, amounting frequently to more than 6c. per ton of coal produced, is used to build up and maintain the machine that in the autumn of 1919 defied all three branches of our national government—executive, judicial and legislative.

When a man seeks employment in a union mine his "card" is demanded and if he is unable to show membership he is compelled to sign an order authorizing his employer to check off an initiation fee ranging from \$5 to \$50. When the amount exceeds \$10 the victim is graciously allowed the privilege of the installment plan, these payments taking precedence over orders given to purchase necessary food and clothing. "I recall a case where the son of a coal mine owner, who was then an engineering student, was compelled to sign up for a fifty-dollar check-off in order to enter his father's mine during vacation as an assistant to the mine surveyor. This method is used to collect funds to fight neighboring operators in the immediate vicinity, or in other states. I further recall where an operator producing coal in two states, checked off

dues in one state to be used against him where his men were on a strike in another state.

"I have before this expressed my belief in the theory of collective bargaining," continued Mr. McAuliffe. "I am in favor of unions soundly constructed and honestly administered. All unions should be forced to incorporate and should be subject to all of the laws, rules and regulations that govern corporate or partnership holdings of capital goods or accumulated savings, including the payment of federal income and excess profits taxes. All malicious interference with the operation of a mining property by its labor should be eliminated."

The consumer, a most important element in the coal industry, must assert himself, if the troubles that continuously beset it are to be remedied. Both coal operators and miners are opposed to the collection and publication of the facts that surround the production and sale of coal. This attitude is a mistaken one, very largely engendered by the legal advisers of the operators and as a matter of course opposed by the oligarchy which controls the union. Surely we can trust our national government to collect and publish reliable data covering this vital industry. No one today questions the integrity of the statistics collected by the government covering the operation of the railroads. "I will quote Secretary Hoover, who on Feb. 3 last, when speaking on the railroad situation, said:

"We are struggling with the great problem of maintaining public control of monopoly, at the same time maintaining the initiative of private enterprise. I believe that we are steadily progressing to solution.

"Great social and economic problems find their solution slowly and by a process of trial and error. We have tried unregulated monopoly, and have tried government operation, and found the error in them."

"Given all the facts we can chart a course that will insure fair sailing for each and all of the four elements that go to make up the coal industry."



Egg and Nut Coal in Storage More Than a Year and a Half

A careful study of the proper sizes of coal for storage purposes has developed that of Illinois coals the size that will stand up best is not the large lump, which usually is given preference by coal retailers.

For the purpose of ascertaining which size would stand up best for domestic purposes in storage, the Union Electric Light & Power Co. laid down in its storage yards on Salisbury Street near the McKinley Bridge, in St. Louis, a large pile of egg and nut coal from Dowell, Ill. This was in the spring and summer

of 1920. This coal is still in storage and with few exceptions shows up unusually well; far better than some storage piles of 6-in. lump. Thousands of people daily have seen this pile of coal and it has been watched by retail coal dealers from both Missouri and Illinois, with the result that they have decided that there is a smaller percentage of loss and breakage with these sizes in storage, without any danger of fire, than with either mine-run or lump.—E. J. Wallace, St. Louis, Mo.

Hultman Recommends Scientific Study of Domestic Fuel; Champions Bituminous

EUGENE C. HULTMAN, Fuel Administrator of Massachusetts, on March 14, 1922, appeared before the joint committee on mercantile affairs of the Massachusetts Legislature with the recommendation that the Massachusetts Institute of Technology conduct a scientific research as to the most economical domestic fuel and its efficient use.

Some of the points brought out by Mr. Hultman follow:

The bill paid by the householders of Massachusetts for anthracite this season will be about \$80,000,000. If the best grade of smokeless bituminous coal had been used for domestic purposes, they would have saved approximately \$40,000,000 on their domestic coal bill this year.

The anthracite situation is the source of increasing hardship to the families of Massachusetts on account of excessive prices, labor difficulties and extremely poor quality of the coal. There is no likelihood of permanent relief, except through the development of a fuel to compete with anthracite for domestic needs.

Many engineers and geologists claim that the anthracite region has reached its maximum production, due to limited deposits of coal; others advance the argument that production is artificially controlled through an understanding among the operators. In either case, the fact remains that as long as the people of Massachusetts allow themselves to depend upon anthracite for their domestic requirements they will have to pay the price demanded by those mining it, as well as such tax as the State of Pennsylvania may impose.

Therefore, the special commission on the necessities of life recommended in its report to the General Court that the Legislature appropriate the sum of \$10,000 a year for a period of three years, to be expended through the division of industrial co-operation and research, Massachusetts Institute of Technology, to study and report annually upon:

(1) The substitution of bituminous coal, the supply of which is practically inexhaustible, for anthracite. The prepared sizes of bituminous coal have been used by householders of the West and Middle West for many years.

(2) The compilation, classification and simplification of instructions for burning fuel in small heating units, such as are commonly used in dwellings.

(3) The compilation and simplification, for use of the layman, of methods and means which may be adopted for cutting down the loss of heat through walls and windows. It should deal with recommendations for building of new houses with proper stops, interlinings, air spaces, etc., and with the question of proper construction of window panes and sashes, and use of double glazing to prevent heat loss.

Mr. Hultman summarized the principal advantages and

disadvantages of anthracite and bituminous coal as a household fuel. The advantages of anthracite are: cleanliness, little smoke, easy control of fire and steady heat, while its recognized disadvantages are high price, monopolistic source of supply, slow response to change of drafts, and high slate and ash content.

On the other hand, the advantages of bituminous coal are low price, competitive sources of supply, quick response to change of drafts, low percentage of inert matter and high heat value, as compared with the disadvantages of being dirty to handle, making more smoke and more attention to fire and furnace being necessary.

Anthracite, he stated, is a luxury at its present price compared with the prices of other fuels. It is an established economic fact that money spent for luxuries which add greatly to the standard or comfort of living is well spent, if the individual or community can afford it; on the other hand, money spent for luxuries without a commensurate return is the worst form of economic waste.

"There is colossal ignorance of and unreasonable prejudice against soft coal on the part of most householders. Folkways are difficult to change, and our habit of using anthracite has been carefully nurtured by those who would lose money if we should use any other fuel. While people will exclaim that soft coal cannot be used in the household, upon questioning they will admit that their opinion is based upon what someone has told them or on an impractical experiment in 1902. At that time the difference in price between the two coals was not as great, or the facts in regard to anthracite supply not as well known, as at present; so that those who used bituminous coal regarded it entirely as a stop-gap fuel, and made little or no attempt to study the best methods of combustion."

According to the U. S. Geological Survey, over one-half of the domestic consumption of the United States in 1917 was bituminous. The total consumption was 106,500,000 tons, of which 49,400,000 tons (46 per cent) was anthracite and 57,100,000 tons (54 per cent) was bituminous. With low-volatile or smokeless bituminous coal properly burned there is but little more smoke than with anthracite. The ash content is 50 per cent lower and the heat unit value is nearly 20 per cent greater than in anthracite.

"The low-volatile bituminous coal regions available to this market," he said, "supply the finest coals in the world, and the only problem we have to solve in order to have a high-grade fuel to compete with anthracite is that of combustion. The Massachusetts Institute of Technology has assisted our manufacturers for years in their problems of combustion. The people of our Commonwealth can employ the service of the Institute of Technology to work out these problems at a cost of about one-fifth of a cent per ton on the present consumption rate of anthracite coal."

Byproduct Coke Produced and Sold or Used by Producers in the United States, 1920, by States and Kinds*

State	Production a		(In Net Tons)		Sales		Used by Producer	
	Coke	Screenings and Breeze	Quantity	Value	Quantity	Value	Quantity	Value
Alabama.....	3,123,890	206,847	228,798	\$1,890,345	27,514	\$301,000	21,300	\$115,428
Illinois.....	2,136,793	197,746	387,790	5,008,243	216,537	3,040,733	267,755	2,479,078
Indiana.....	4,553,697	326,546	180,718	2,120,703	196,208	2,667,306	385,842	3,083,628
Kentucky.....	466,985	42,283	364,266	2,623,676	44,098	501,462	64,278	534,466
Maryland.....	682,132	50,360	7,437	(b)			2,520	(b)
Massachusetts.....	488,089	33,150			355,365	(b)	132,410	(b)
Michigan.....	1,393,445	92,388	291,793	3,227,253	400,696	5,553,922	448,752	4,107,026
Minnesota.....	674,801	45,504	106,085	1,127,699	57,229	744,511	163,765	1,719,202
New Jersey.....	725,571	72,330	453,831	(b)	95,164		221,837	(b)
New York.....	1,040,192	38,980	297,628	3,471,321	8,036	99,003	90,220	1,022,880
Ohio.....	5,614,877	423,887	651,654	6,547,341	632	4,418	169,216	1,135,150
Pennsylvania.....	7,730,256	777,027	544,152	6,291,166			173,763	941,250
Tennessee.....	139,121	5,141	98,677	900,300	39,702	460,490		
Washington.....	26,284	6,014	1,057	10,993				
West Virginia.....	447,392	7,512	36,348	397,569			9,110	70,989
Combined States: Colorado Missouri Rhode Island Wisconsin	1,590,426	135,120	404,730	9,224,613c	274,701	10,305,380d	213,489	5,871,331d
Total United States	30,833,951	2,460,835	4,054,964	\$42,841,222	1,715,882	\$23,678,225	2,361,737	\$21,080,429

*As reported by the U. S. Geological Survey

(a) The total value of production, based on the average of sales, amounted to: Coke, \$313,028,732; screenings, \$4,434,818. (b) Included with combined States.

(c) Includes also value of Maryland and New Jersey furnace coke. (d) Includes also value of Massachusetts and New Jersey foundry and domestic coke. (e) Includes also value of Maryland, Massachusetts and New Jersey screenings.

Fairmont Reported to Be Ready to Compromise; Lewis Firm for Negotiation on Central Field Basis

ALL likelihood of a Central Competitive Field conference having faded, the centers of interest in the impending wage conflict in the soft-coal fields have shifted to the outlying fields. Among these the situation in the Fairmont region of northern West Virginia, for the time being, is the most significant. It is reported that the largest operator in this district on March 11 suggested to a joint conference of operators and miners at Fairmont that they jointly proceed to negotiate a scale without reference to what may or may not be done in the Central Competitive Field and intimated that the check-off is of minor importance. This is held by those in touch with the situation nationally to mean that the Fairmont field is preparing to concede the check-off for a scale and is cited as the first important recession from announced policy of elimination of the check-off.

It is pointed out that the real opponents of the check-off among the operators are now narrowed down to the Pittsburgh Coal Producers Association, the Southern Ohio Coal Operators, the Central Coal Association, which represents a minority in central Pennsylvania, and the Kanawha operators. These groups, it is emphasized, are not so located as to insure their being able to hold out indefinitely should they alone attempt to make the elimination of the check-off a real issue.

In nearly every union soft-coal field the operators have attempted to open negotiations with the local union. Illinois producers now have the promise of Frank Farrington, district president of the union, to meet them prior to April 1, providing John Lewis, international president, has not in the meantime brought about an interstate conference. In the Southwest the two sides have had a preliminary conference and in Fairmont there is said to be prospect of early negotiations looking toward a new contract. Elsewhere there is no present indication of other than a suspension without even a preliminary canter. The Lewis forces are holding firm to his policy of no action save through a basic wage scale in the Central field. Even Mr. Brophy, who supported Farrington at Indianapolis last month, is following Mr. Lewis' lead in this.

While Secretary Davis was in New York on March 15, looking in on the anthracite wage conference, a statement was given out at his department in Washington summarizing the positions taken by the operators in the Central Competitive Field. This statement, given out March 17, follows:

PROPOSED PRELIMINARY JOINT CONFERENCE OF COAL OPERATORS AND MINERS REPRESENTING WESTERN PENNSYLVANIA, OHIO, INDIANA AND ILLINOIS, KNOWN AS THE CENTRAL COMPETITIVE STATES

Obligation:—Resolved, that an interstate joint conference be held prior to April 1, 1922; the time and place of holding such meeting is referred to a committee of two operators and two miners from each state herein represented, together with the International officers of the United Mine Workers' organization.

Status of Negotiations on March 17, 1922.—President John L. Lewis invited the operators to meet as per above resolution, in Pittsburgh, Jan. 6, 1922, but withdrew the call later because of unsatisfactory replies, which indicated that a full attendance could not be secured. A second call was issued by Mr. Lewis for March 2, 1922, but with the same unsatisfactory results.

The Secretary of Labor, at the request of the President, Feb. 24, 1922, took up the question of securing the desired conference with the following results:

The Pittsburgh Coal Producers Association positively declined to join in the renewal of the Central Competitive states agreement; therefore attendance at agreed conference deemed useless so far as they are concerned; but will meet with their own miners to negotiate an agreement without the check off.

The Pittsburgh operators have posted a wage scale, effective April 1, which calls for a reduction of 35 to 40 per cent.

Pittsburgh & West Virginia Railway Coal Operators Association and Panhandle Coal Operators Association request the right of representation in any Central Competitive states conference, although they had not been included in the previous conferences of said states.

The Southern Ohio Coal Operators Association decline to join in any interstate agreement but will meet their own employees to negotiate one. They were parties to all previous Central Competitive states agreements. They contend that the miners' claims in excess of the Bituminous Commission's award as per agreement of March 31, 1920, disrupted the interstate movement, and that the methods of arriving at the interstate wage agreement have been challenged in the federal courts as violation of the Sherman anti-

trust law. They have also posted a wage scale effective April 1, similar to Pittsburgh.

The Eastern Ohio Coal Operators Association at first declined to join in any interstate wage agreement for same reasons as Pittsburgh. They later agreed to attend March 2 meeting if operators of all four states attended. Five prominent coal operators of this association suggest a joint conference of all union mines in the United States. The Central Ohio Coal Operators Association also suggests a national joint conference of the entire industry or especially of the union mines.

The No. 8 Ohio Coal Operators protest against a Central Competitive states meeting, but are willing to meet representatives of their employees and their union officers to negotiate their own scale. They object to eastern Ohio operators making their scale same as in the past, as they produce 40 per cent to eastern Ohio's 60 per cent tonnage of the district. They ask aid of the department to secure the desired local conference.

The Indiana Coal Operators Association accepted the invitation of first called meeting Jan. 6, also to the meeting called March 2, but this second acceptance was qualified by an expression of futility of such a conference after the declaration of miners' policy and demands framed at their Indianapolis conference, Feb. 4, and that they could not seriously consider same nor agree to meet in conference for such a purpose.

The Illinois Coal Operators Association, the Operators Association of 5th and 9th Districts, and the Central Illinois Coal Operators Association, representing the whole State of Illinois, are ready to attend any conference of the Central Competitive states without any qualifications and request a conference with the representatives of their own employees and state officials of the United Mine Workers if President Lewis fails to secure a conference of the four Central Competitive states before March 31. President Farrington for the Illinois miners protests the appointment of any federal commission in the case, as he is confident that he can secure a settlement for Illinois.

On March 16 the Federal Council of the Churches of Christ in America issued a statement to the public press appealing to the mine workers and coal operators to settle their differences through conferences and that both parties "recognize that the establishment of right human relations takes precedence over any economic issue." The statement lays particular stress on the clause in the present contract calling for a conference prior to April 1 and says: "The mere existence of this pledge of honor is sufficient to overrule all objections to conference."

AMERICAN FEDERATION ASSURES SUPPORT

Come what may, the American Federation of Labor is with the mine workers of America in their struggle against the mine owners, according to a statement issued on March 16 by that organization.

"No group of employers in any industrial controversy in this country has ever placed itself in a more indefensible position than that occupied by the mine owners at this time. Bound by a solemn agreement to confer with the workers upon the terms of a new agreement, they have refused to abide by the terms of their own pledge," the statement continues, and concludes:

"The cause of the miners is just, and in that just cause they will have the united and unswerving support of the great labor movement of our country."

District No. 2 of the United Mine Workers of America, meeting at Du Bois, Pa., on March 10, called on the public to join with the miners in demanding through federal action the facts of "the hopelessly messed coal industry." The convention declared in the call that the coal grievances of the public grew out of the same causes as the miners' grievances, and urged that the government publish all the facts as the first step in a fundamental organization of the industry. The convention declared that the necessity of public ownership of coal mines and the economic and human wastes of private ownership had been demonstrated, and it congratulated the national convention of the union for setting up the nationalization research committee to "transform the miners' policy of nationalization from a vague aspiration into a fighting program."

The Kanawha operators on March 16 announced their decision to postpone until March 27 further consideration of a new wage scale. On that date their board of directors will meet and on March 29 will give its decision to the membership. The invitation of this association to the miners' union to meet on or before March 11 brought no response from the miners.

Farrington Agrees to Meet Illinois Operators Before March 31

Message to Producers Indicates Intention to Stick to Union as Long as Possible—Wants No U. S. Coal Board
BY E. W. DAVIDSON

THE Middle West spent the past week progressing calmly seven days closer to a general mine strike on April 1, with the market stagnant, production rolling along at about 50 per cent of normal and with no more interesting event in the labor field than the sending of two messages by Frank Farrington, president of the Illinois miners and potential leader of a rebellion in the United Mine Workers of America. He replied to the Illinois Coal Operators Association that even though it is too late to prevent a strike he would meet them in separate wage negotiations some time between now and March 31, after the Mine Workers' last hope for a four-state conference has been shattered, and he wired Secretary of Labor Davis that Illinois miners hope the government will let miners and operators settle their own differences.

The tone Mr. Farrington adopted in his message to the operators lacks cocksureness and indicates that the Illinois king of miners may be having some trouble holding his own forces in line behind him. Mr. Farrington, in failing to go at once into a wage conference in the face of the wishes of union headquarters, gives the appearance of having encountered some obstacle. Judging by his tone, he is trying now to make it plain that he is going to stick to the union as long as possible. But it is evident he is willing to meet the operators and hopes to keep them in a friendly mood until he can do it.

The significant part of Farrington's March 15 message to the Illinois Operators Association, which had urged him to hurry and decide whether to meet them, runs:

Our district executive board has directed me to say to you that in their opinion President Lewis still has a lingering hope that the miners and operators in the Central Competitive Field will be brought together in wage scale conference through government influence and that a four-state agreement will eventuate therefrom. Naturally we are anxious to co-operate with President Lewis to the end that an interstate agreement may be consummated and consequently we do not want to do anything that might hamper him in his efforts to bring about an interstate conference, therefore we earnestly urge that the Illinois operators relieve us at this time of the necessity of definitely stating the date upon which we shall meet them in district wage scale conference. However, should developments make it apparent that an interstate wage scale conference is not to be held previous to March 31, we assure you that we shall enter into district wage scale negotiations on some date previous to March 31, as provided for in the thirty-second section of our state agreement.

The message of March 15 from Farrington to Secretary Davis opposing the appointment of a government commission to settle the present difficulty between miners and operators gives the impression that Illinois miners thought mine-union headquarters were trying to get such a commission created.

The only other public action in the labor trouble taken west of Ohio was the telegram of the Southwest Coal Operators Association to Secretary Davis at Washington March 13 protesting vigorously against governmental action looking toward a four-state wage conference.

Thus, so far as the Middle West is concerned, the deadlock between miners and operators remains in that well known condition, *status quo*.

Railroads Heard in Probe of Bunker Rates

THE Interstate Commerce Commission on Monday, March 20, began an investigation of bunker coal rates to determine whether the railroads should make the rates on bunker coal lower than those on coal used locally in the ports. The railroads were represented by C. A. Cochran of the Baltimore & Ohio; E. B. Hotchkiss, for the Chesapeake & Ohio, and Walter Thayer for the Pennsylvania.

The commission is faced with a provision of law which says that the rates cannot be based on the use to which the

coal is put. Notwithstanding this, both the carriers and shippers contend that it is not a violation of law to make rates for bunker purposes lower than rates for local purposes at port.

Representatives of the railroads only were heard on Monday. They said that they make one rate for coal to be delivered at side tracks at ports (line trade), another for coal to be shipped by vessel to destination inside the Virginia Capes and another for coal to be sent beyond the Capes, none of which is dependent upon the use to which the coal is to be put. They asserted that on coal for local ports the railroads performed more service than for delivery to ships and that the coal for ports should bear a higher rate than the coal for bunkers.

The investigation is being conducted by W. P. Bartel, an examiner for the commission, who stated that it had ruled in the New Orleans case that lower rates on bunker coal were unlawful because they were less than rates on coal for local delivery. It was said, however, that as the railroads do not publish cargo coal rates to New Orleans, the situation is different from that at North Atlantic ports.

Morrow Letter Says Lewis Misquoted Price Evidence Before Commerce Commission

IN a letter to John L. Lewis, president of the United Mine Workers' of America, under date of March 11, J. D. A. Morrow, vice-president of the National Coal Association, directs attention to a misquotation of his evidence before the Interstate Commerce Commission in urging freight rate reductions on coal last January, as embraced in a statement sent out by the United Mine Workers' of America last week.

In his letter Mr. Morrow says that the United Mine Workers' statement, which has been sent out broadcast, gave an entirely erroneous impression, in making him appear to have said that while the miner was paid \$1.97 per ton for mining coal the coal itself was selling at an average of \$10.41 per ton.

In his letter Mr. Morrow says:

"I know you wish to quote sworn testimony accurately and, therefore, wish to advise you that I made no statement that the average selling price of bituminous coal in the United States in October, 1921, was \$10.41 per ton. The exhibit filed with the Interstate Commerce Commission, which represents the only information on this subject in our possession or given to the commission or anyone else, showed that the average price of bituminous coal f.o.b. the mines, run-of-mine basis, for the seven months April to October, 1921, was \$2.89, and that the miners received 67.8 per cent, or \$1.97 per ton, out of the total cost of \$2.91 for producing that coal. The figures for the month of October, 1921, were: Average amount received per ton, \$2.73, and average total cost per ton, \$2.59. The same exhibit shows that in the month of November the average amount received was \$2.67, and the average cost of producing the coal was \$2.72. Similar figures for December were: Average price at which the coal was shipped, \$2.56; average cost of producing it, \$2.91.

"In view of the misleading and erroneous impression created by the statement of your organization, if the figures used therein are as I understand them to be, will you kindly see that a correction is published which will accurately quote the testimony submitted to the Interstate Commerce Commission."

Mine Workers' Committee to Meet March 24 At Cleveland to Settle Strike Policy

THE policy committee of the United Mine Workers of America, composed of 116 representatives, will meet at Cleveland March 24 to determine upon policies to be pursued by the miners in case they walk out or cease operations April 1. A statement to this effect was made by John L. Lewis, president of the union, in Washington on Monday, March 20.

Anthracite Agreement Not Expected by April 1; Mines Probably Will Suspend

OPENING in New York City March 15, the sixth general wage conference between the mine workers and operators of the anthracite fields since the award of 1903 of the Anthracite Coal Strike Commission was attended by 74 representatives of the operators and 39 members of the miners' tri-district scale committee in addition to International President John L. Lewis and Vice-President Philip Murray.

President Lewis called the conference to order and William L. Connell, of Scranton, was chosen as permanent chairman and James Gorman, of Hazleton, Pa., as secretary. President Lewis made formal presentations of the demands adopted at the Shamokin convention and they were outlined in detail by District Presidents Thomas Kennedy, Chris Golden and William J. Brennan, and Andrew Matti, vice-president of District No. 7.

S. D. Warriner, president of the Lehigh Coal & Navigation Co., as chairman of the operators' general policies committee, requested a recess so that the operators could consider the demands of the workers, and an adjournment was taken until March 17 at 2:30 p.m.

The demands of the miners were given in full in *Coal Age* of Jan. 26.

When the conference was resumed on March 17 at the Pennsylvania Hotel Mr. Warriner presented the reply of the operators to the demands of the miners. As was expected, the mine owners insist that a reduction in wages is imperative, saying that readjustment of wage rates is the first essential step to a reduction in the price of anthracite to the consumer and to insure continued stability in the industry.

After the reply had been presented, upon motion of Mr. Warriner it was decided to refer the demands of the miners and the reply of the operators to a joint sub-committee of operators and miners for the purpose of arriving at an agreement. Those representing the operators will be Mr. Warriner, W. J. Richards, president of the Philadelphia & Reading Coal & Iron Co.; W. W. Inglis, president of the Glen Alden Coal Co., and W. L. Connell, representing the independent coal operators. For the miners there will be the three district presidents, Messrs. Kennedy, Golden and Brennan, and International President Lewis, with Vice-President Murray as alternate for Mr. Lewis. Alvin Markle was chosen chairman of the joint sub-committee and James A. Gorman, secretary, both without votes. The discussion of the demands was scheduled to begin Tuesday afternoon, March 21.

Apparently there is no expectation that an agreement can be reached before April 1. Lacking an agreement and contract, the mines will suspend operations, it is said.

The statement of the operators in full follows:

The object of this conference should be to construct a working agreement which will, in contrast with conditions in other coal fields, continue to afford a basis whereby the anthracite industry will provide fair wages, full-time employment to its workers, and a maximum production of coal at a cost which will enable it to be sold to its customers at a price they are able to pay.

The consuming public is largely composed of wage earners in other industries, who have already accepted substantial decreases in their earnings, and who cannot continue to pay present prices in order that the workmen in the anthracite field may hold their present scale of wages.

With these facts in mind the general policies committee is authorized to say in reply to your communication to the joint conference of anthracite operators and miners, embodying 19 demands to be used as the basis of an agreement to take the place of the one now in effect, which expires March 31, next:

Careful consideration has been given to the demands and to the explanatory remarks made by the speakers at the joint conference. It should be stated in the first place that the anthracite operators are not unwilling to continue contractual relations with the United Mine Workers of America, but, on the contrary, are willing to continue the practice of dealing with that organization as representing their employees, provided that the form of contract is in accord with the principles laid down by the Anthracite Coal Strike Commission, appointed by President Roosevelt in 1902, and the Anthracite Coal Commission, appointed by President Wilson in 1920; and, provided, further, that the jurisdiction of the Board of Conciliation that has been a potent factor in the preservation of peace in the anthracite region shall not be questioned or abridged. The operators are ready to consider and discuss any proposition relating to wages and working conditions submitted by either party.

When it comes to matters affecting the cost of production, there is another party to be considered, viz: the buyer. Any adjustment which is not satisfactory to the buyer must inevitably fail, for in that event production cannot be distributed, and the miner will then lose his opportunity for employment. The interests of all parties will best be conserved by steady work for the miner, maximum production at the mines, and the widest possible market for the product. To secure this a reasonable cost of production is necessary. Anthracite is the only basic commodity which has not receded in cost of production since the war. In fact, costs of anthracite production today are far above the wartime peak.

The deflated pocketbook of the buyer cannot continue to pay the present prices. Economy is being practiced by the consumer and various substitutes for anthracite are being used. But for the fear on the part of the public of a suspension April 1, the recent movement of anthracite would have been even less than it was, with the result of short time employment throughout the region. The economic situation today not only forbids any increase in costs and prices but compels a reduction.

Anthracite labor is the only group in this country which has not sustained a decrease in wages in line with the general readjustment in other industries nor has it suffered a material decline in the opportunity for steady work. Deflation in the cost of production, 70 per cent of which is represented by mine labor, is imperative. The anthracite operators, after most careful thought, can see no alternative. Readjustment of the wage rates is the first necessary step to reduce the cost of anthracite to the consumer and to insure continued stability in the industry.

It is obvious, then, that prosperity and steady work in the anthracite fields must cease unless the price of anthracite coal can be reduced to a figure which the consumer can pay. We are confident that if in our negotiations this absolutely controlling factor is kept constantly in mind we shall be able to reach a conclusion which will promote the welfare of all concerned. And with this hope we are prepared to consider through the negotiating committee any matter pertaining to wages and working conditions presented by either party.

Sewalls Point Exchange Ceases Operation

MEMBERS of the Sewalls Point Coal Exchange have ratified the action of the board of directors in voting to wind up its affairs, and the exchange has ceased to operate. This action had been under discussion for several months. This leaves only the Newport News Coal Exchange in operation, the Lamberts Point Exchange having ceased to function Feb. 15.

There is some talk in trade circles of reviving the Sewalls Point Exchange under another organization of a more commercial character, but nothing definite in this regard has been accomplished.

The sampling plant of the Sewalls Point exchange is the most modern of its kind and proved an innovation in the classification of coal at Hampton Roads. Some arrangement whereby this plant may still be used as an adjunct to the coal piers is being thought out. The Sewalls Point exchange handled all the coal shipped over the Virginian Ry. terminals, and in the future its dissolution will not affect the handling of coal except that it will be consigned to individual shippers instead of to the pools.

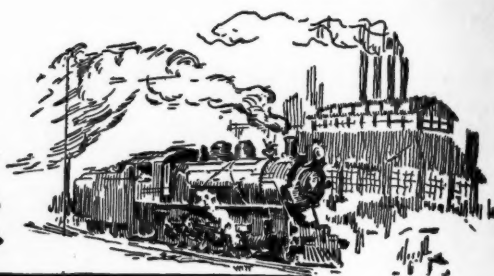
State Police at Thomas, W. Va., Guard Men Who Return to Work at Reduced Wage

IT became necessary on March 13 to assign a detachment of state police to duty at Thomas, W. Va., where the Davis Coal & Coke Co. is operating mines. This precaution has been taken to protect the miners who are willing to work at a reduced wage. The decision to assign state police to Thomas followed an attack made by wives and sympathizers of foreign miners on a number of mine workers on their way to work at Thomas on Saturday, March 11. As these men passed through a cut on the public highway they were so severely pelted with stones that they had to turn back. Captain White of the state police joined Sheriff Close of Tucker County on the Monday following and after making the rounds with him decided to send four members of the police to Thomas.

So far the miners opposed to any wage reduction—and they consist largely of foreigners and negroes, who predominate in this section—have resorted only to picketing and to a show of force, surrounding miners who want to go to work and turning many of them back.



Production and the Market



Weekly Review

STRIKING evidence of the weakened condition of the market is found in the marked decline in spot prices this week, ten of the fourteen coals entering into the *Coal Age* Index recording decreases, with the result that the index dropped five points to 173, the sharpest decline this year. Spot prices on soft coal are now lower than at any time since the middle of 1916.

But while prices have been dropping, production has gone up. Forced sales and stocking by railroads and public utilities have taken the large outputs in recent weeks. In the last few days before April 1 the operators of union mines will fill every car they can obtain, thus holding production to a high level up to the last minute.

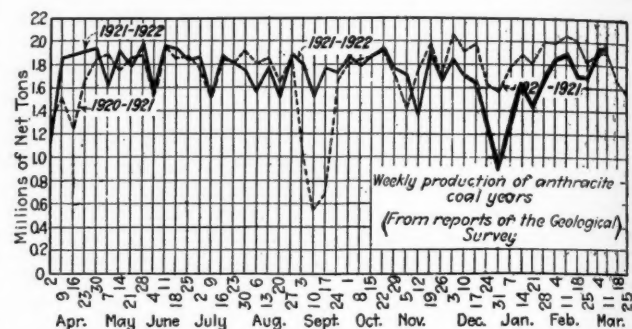
There is no feeling of apprehension now being shown by consumers in the face of the impending suspension. The reason for this, of course, is that stocks are in comfortable volume and that with the present low rate of industrial consumption they will last for some time. Then, too, non-union offerings are heavy. The tendency now is to stay out of the market until reserves are in need of replenishment. Inquiries continue numerous, however, and it is plain that consumers want to have access to non-union supply when the need comes.

MARKET SLUGGISH, NON-UNION OFFERS PLENTIFUL

That this supply will be more than ample is indicated by the increasing number of contract offers that are being made, and this non-union contract interest may be expected to grow as long as the spot market lacks snap. A New England railroad has just completed an arrangement for a large tonnage, over the next twelve months, at \$1.50 for a good grade of Connellsville coal. The next few months' outlook for the coal producer is not encouraging. The supply, plus reserves now in hand, is so topheavy that considerable improvement in consumption requirements must be made before the

market can come to a turning point. The industrial horizon is not altogether dark, however. Industrial convalescence is slowly but surely gaining ground. The steel mills are showing more signs of stability. Building trades are more active and better buying all around is predicted as farm products are becoming stronger.

Hard-coal demand is waning, although there is more of a tendency toward retail stocking than in the bituminous coal trade. Dealers have generally taken pre-

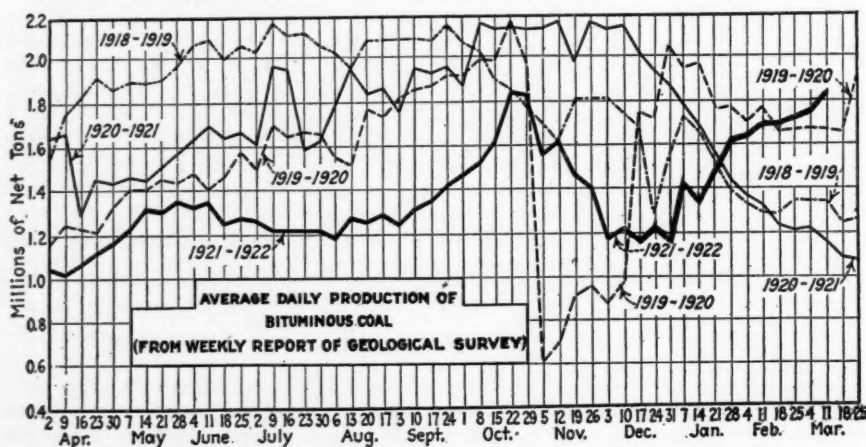


cautions to carry over sufficient tonnage of the family sizes to meet their needs until about May 1. Steam coals are moving well but large users are nearly stocked up and heavy storage at the mines reassures those who have not yet taken all they think necessary.

The coke market has turned easier but prices are not yet softening. There is no diminution in demand to account for the changed conditions, which is attributable to the poorer call in the coal market.

BITUMINOUS

Production increased another 500,000 tons during the week ended March 11. The output was 11,058,000 net tons, as compared with 10,553,000 tons in the previous week. Car loadings on the first two days of last week indicate that the upward trend is being continued. The present



Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1921-1922	1920-1921
Feb. 25 (b).....	10,402,000	7,432,660
March 4 (b).....	10,553,000	7,278,000
March 11 (a).....	11,058,000	6,900,000
Daily average.....	1,843,000	1,150,000
Coal year.....	403,047,000	503,539,000
Daily av. coal yr.....	1,392,000	1,732,000

ANTHRACITE

March 4.....	1,913,000	1,902,000
March 11 (a).....	1,982,000	1,925,000
Coal year (b).....	81,261,000	85,471,000

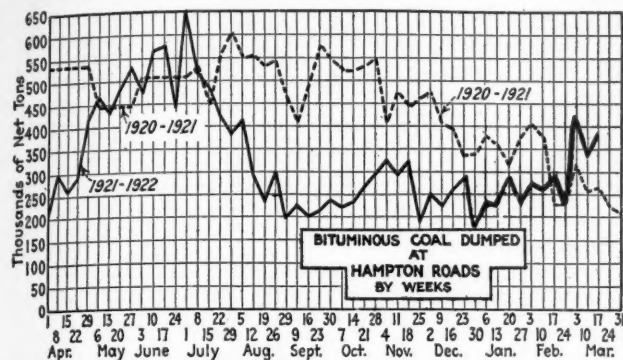
COKE

	1922	1921
March 4 (b).....	143,000	178,000
March 11 (a).....	154,000	162,000
Calendar year.....	1,294,000	2,257,000

(a) Subject to revision. (b) Revised from last report

course of production is like that of last fall, when buyers increased their orders in anticipation of a railroad strike.

Much of the recent output has gone into storage, but it probably would require further stocking of 7,000,000 tons before reserves reach the level which obtained at the close of the war. Industrial consumers are not inclined



to take more storage coal, as stocks are considered nearly adequate. Business activity is not increasing rapidly enough to cause buyers any apprehension about present reserves, which are not as heavy as when strikes have

impended in the past. With the prospect of lower delivered fuel costs in the future and with non-union tonnage available in such good volume the buyer fails to see the necessity for further expenditures on his fuel account.

Railroads and public utilities, however, are continuing to accumulate tonnage. The carriers are not only storing at their usual supply bases but have in many cases repaired bad-order cars sufficiently to permit their being loaded and stored on track. Operators are filling every car available, especially in the Midwest, and there is much tonnage standing on track throughout the country.

The domestic market is stagnant. Householders are indifferent to the strike prospects and are making provision only for the balance of the season. Retailers reflect this attitude in their orders, as they profess a desire to reduce their yard stocks to a minimum in order to take advantage of the changed mining conditions after the strike.

All-rail shipments to New England are holding fairly well. During the week ended March 11 there were 3,695 cars moved, as compared with 3,868 cars in the preceding week. This tonnage is largely contract fuel which is being pressed on old agreements before their expiration on April 1. Pennsylvania spot coals are very slow in this section, except where special price cuts have been made.

Dumpings for all accounts at Hampton Roads were

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern		Market Quoted	Feb. 20 1922	Mar. 6 1922	Mar. 13 1922	Mar. 20 1922†
Poehontas lump.....	Columbus....	\$3.25	\$3.20	\$3.15	\$3.00@3.15	
Poehontas mine run.....	Columbus....	2.10	1.85	1.85	1.75@2.00	
Poehontas screenings.....	Columbus....	1.55	1.35	1.45	1.10@1.25	
Poehontas lump.....	Chicago....	3.15	3.15	3.15	3.00@3.25	
Poehontas mine run.....	Chicago....	2.15	2.00	1.85	1.65@2.00	
Poehontas screenings.....	Cincinnati....	1.75	1.75	1.75	1.75@2.00	
Poehontas mine run.....	Cincinnati....	1.15	1.15	1.15	1.00@1.25	
Poehontas screenings.....	Cincinnati....	1.15	1.15	1.15	1.00@1.25	
Smokeless mine run.....	Boston....	4.55	4.65	4.60	4.50@4.65	
Clearfield mine run.....	Boston....	1.95	1.95	1.95	1.65@2.25	
Cambridge mine run.....	Boston....	2.45	2.45	2.45	2.25@2.60	
Somerset mine run.....	Boston....	1.90	1.90	1.90	1.75@2.00	
Pool 1 (Navy Standard).....	New York....	3.00	3.00	2.95	2.75@3.00	
Pool 1 (Navy Standard).....	Baltimore....	3.05	3.05	3.05	2.85@3.15	
Pool 1 (Navy Standard).....	Baltimore....	2.55	2.70	2.65	2.60@2.70	
Pool 9 (Super. Low Vol.).....	New York....	2.50	2.50	2.40	2.10@2.50	
Pool 9 (Super. Low Vol.).....	Philadelphia....	2.45	2.45	2.45	2.10@2.60	
Pool 9 (Super. Low Vol.).....	Baltimore....	2.25	2.30	2.15	2.00@2.25	
Pool 10 (H. Gr. Low Vol.).....	New York....	2.10	2.10	2.10	1.75@2.05	
Pool 10 (H. Gr. Low Vol.).....	Philadelphia....	2.10	2.10	2.10	1.90@2.20	
Pool 10 (H. Gr. Low Vol.).....	Baltimore....	2.05	2.15	2.10	2.10@2.15	
Pool 11 (Low Vol.).....	New York....	1.75	1.75	1.70	1.60@1.80	
Pool 11 (Low Vol.).....	Philadelphia....	1.75	1.75	1.75	1.65@1.85	
Pool 11 (Low Vol.).....	Baltimore....	1.75	1.95	2.05	2.00@2.10	
High-Volatile, Eastern						
Pool 54-64 (Gas and St.).....	New York....	1.50	1.60	1.60	1.45@1.60	
Pool 54-64 (Gas and St.).....	Philadelphia....	1.50	1.50	1.50	1.40@1.60	
Pool 54-64 (Gas and St.).....	Baltimore....	1.40	1.55	1.55	1.50@1.60	
Pittsburgh se'd. Gas.....	Pittsburgh....	2.65	2.70	2.70	2.60@2.70	
Pittsburgh mine run (St.).....	Pittsburgh....	2.15	2.15	2.15	1.90@2.10	
Pittsburgh slack (Gas).....	Pittsburgh....	1.65	1.65	1.65	1.50@1.60	
Kanawha lump.....	Columbus....	2.65	2.50	2.50	2.25@2.40	
Kanawha mine run.....	Columbus....	1.65	1.60	1.60	1.40@1.65	
Kanawha screenings.....	Columbus....	1.30	1.30	1.40	1.35@1.50	
W. Va. Splint lump.....	Cincinnati....	2.35	2.25	2.50	2.00@2.25	
W. Va. Gas lump.....	Cincinnati....	2.05	2.00	2.15	1.75@2.00	
W. Va. mine run.....	Cincinnati....	1.50	1.35	1.35	1.35@1.50	
W. Va. screenings.....	Cincinnati....	1.20	1.30	1.30	1.25@1.35	
Hooking lump.....	Columbus....	2.65	2.65	2.60	2.50@2.70	
Hooking mine run.....	Columbus....	1.90	1.90	1.90	1.65@1.90	
Midwest						
Franklin, Ill. lump.....	Chicago....	3.30	3.25	3.45	3.15@3.65	
Franklin, Ill. mine run.....	Chicago....	2.50	2.50	2.50	2.25@2.75	
Franklin, Ill. screenings.....	Chicago....	2.00	2.00	1.85	1.75@2.10	
Central, Ill. lump.....	Chicago....	3.00	3.00	2.80	2.55@3.00	
Central, Ill. mine run.....	Chicago....	2.35	2.35	2.35	2.25@2.50	
Central, Ill. screenings.....	Chicago....	1.80	1.75	1.75	1.65@1.85	
Ind. 4th Vein lump.....	Chicago....	3.25	3.25	3.25	3.00@3.25	
Ind. 4th Vein mine run.....	Chicago....	2.50	2.50	2.40	2.40@2.50	
Ind. 4th Vein screenings.....	Chicago....	2.00	2.15	2.15	1.90@2.15	
Ind. 5th Vein lump.....	Chicago....	3.20	2.80	2.80	2.55@3.00	
Ind. 5th Vein mine run.....	Chicago....	2.25	2.35	2.35	2.10@2.35	
Ind. 5th Vein screenings.....	Chicago....	1.75	1.65	1.60	1.50@1.75	
Standard lump.....	St. Louis....	2.75	2.60	2.60	2.40@2.70	
Standard mine run.....	St. Louis....	1.95	1.95	1.85	1.75@1.85	
Standard screenings.....	St. Louis....	1.20	1.10	1.20	1.00@1.25	
West. Ky. lump.....	Louisville....	2.50	2.45	2.45	2.25@2.50	
West. Ky. mine run.....	Louisville....	1.85	1.85	1.85	1.65@1.90	
West. Ky. screenings.....	Louisville....	1.40	1.80	1.65	1.40@1.65	
South and Southwest						
Big Seam lump.....	Birmingham..	2.90	2.60	2.60	2.50@2.75	
Big Seam mine run.....	Birmingham..	1.85	1.85	1.85	1.70@2.00	
Big Seam (washed).....	Birmingham..	2.10	1.85	1.85	1.75@2.00	
S. E. Ky. lump.....	Louisville....	2.60	2.45	2.35	2.00@2.25	
S. E. Ky. mine run.....	Louisville....	1.55	1.55	1.50	1.50@1.65	
S. E. Ky. screenings.....	Louisville....	1.20	1.30	1.35	1.25@1.35	
S. E. Ky. lump.....	Cincinnati....	2.50	2.25	2.25	2.00@2.25	
S. E. Ky. mine run.....	Cincinnati....	1.50	1.40	1.35	1.25@1.60	
S. E. Ky. screenings.....	Cincinnati....	1.10	1.20	1.30	1.15@1.35	
Kansas lump.....	Kansas City..	5.00	5.00	5.00	5.00	
Kansas mine run.....	Kansas City..	4.00	4.00	4.00	4.00	
Kansas screenings.....	Kansas City..	2.50	2.50	2.50	2.50	

*Gross tons, f.o.b. vessel, Hampton Roads.

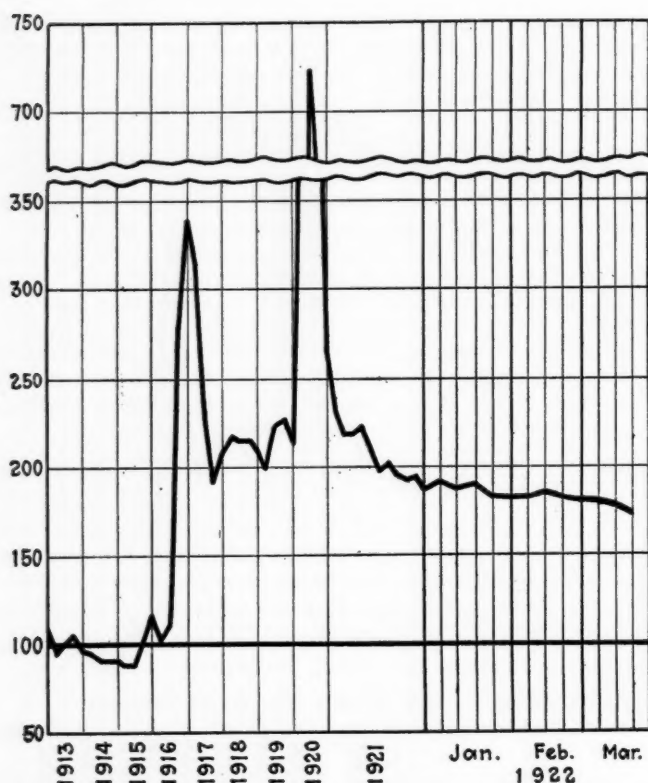
†Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

		Market Quoted	Freight Rates	March 6, 1922		March 13, 1922†		March 20, 1922†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.61			\$7.60@7.75		\$7.60@7.75		\$7.60@7.75
Broken.....	Philadelphia....	2.66		\$7.00@7.50	7.75@7.85	\$7.00@7.50	7.75@7.85	\$7.00@7.50	7.75@7.85
Egg.....	New York....	2.61		7.25@7.50	7.60@7.75	7.35@7.75	7.60@7.75	7.35@7.75	7.60@7.75
Egg.....	Philadelphia....	2.66		7.15@7.75	7.75	7.15@7.75	7.75	7.15@7.75	7.75
Egg.....	Chicago....	5.63		7.50*	6.90@7.40*	7.50*	6.90@7.40*	7.50*	6.90@7.40*
Stove.....	New York....	2.61		7.75@8.10	7.90@8.10	7.85@8.10	7.90@8.10	7.75@8.10	7.90@8.10
Stove.....	Philadelphia....	2.66		7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Stove.....	Chicago....	5.63		7.75*	7.20@7.60*	7.75*	7.20@7.60*	7.75*	7.20@7.60*
Chestnut.....	New York....	2.61		7.85@8.10	7.90@8.10	7.90@8.10	7.90@8.10	7.85@8.10	7.90@8.10
Chestnut.....	Philadelphia....	2.66		7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Chestnut.....	Chicago....	5.63		7.75*	7.20@7.60*	7.75*	7.20@7.60*	7.75*	7.20@7.60*
Pos.....	New York....	2.47		4.50@5.50	5.75@6.45	4.50@5.50	5.75@6.45	4.75@5.50	5.75@6.45
Pos.....	Philadelphia....	2.38		4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25
Pos.....	Chicago....	5.63		6.00*	5.60@6.10*	6.00*	5.60@6.10*	6.00*	5.60@6.10*
Buckwheat No. 1.....	New York....	2.47		3.00@3.50	3.50	3.00@3.50	3.50	2.75@3.50	3.50
Buckwheat No. 1.....	Philadelphia....	2.38		2.75@3.50	3.50	2.75@3.50	3.50	2.75@3.50	3.50
Rice.....	New York....	2.47		2.00@2.60	2.50	2.00@2.60	2.50	2.00@2.60	2.50
Rice.....	Philadelphia....	2.38		2.00@2.60	2.50	2.00@2.60	2.50	2.00@2.60	2.50
Barley.....	New York....	2.47		1.40@1.50	1.50	1.50@1.75	1.50	1.50@1.75	1.50
Barley.....	Philadelphia....	2.38		1.50@1.75	1.50	1.50@1.75	1.50	1.50@1.75	1.50
Birdseye.....	New York....	2.47		1.65@1.75	2.00@2.50	1.65@1.75	2.00@2.50	1.65@1.75	2.00@2.50

*Net tons, f.o.b. mines.

†Advances over previous week shown in heavy type, declines in italics.



Coal Age Index 173, Week of March 20, 1922. Average spot price for same period, \$2.10. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

377,307 net tons during the week ended March 16, as compared with 346,553 tons in the previous week. Accumulations at Tidewater have declined, while vessel tonnage awaiting cargo has increased. Most of the coal dumped is going to New England. Those markets are so surfeited with coal that prices has sagged, while distress cargoes are on the increase.

ANTHRACITE

Production of anthracite increased to 1,982,000 net tons during the week ended March 11, as compared with 1,913,000

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Mar. 4, 1922 Inclusive	Week Ended Mar 4
Non-Union			
Alabama.....	63.5	61.2	66.1
Somerset County.....	55.5	74.4	75.7
Panhandle, W. Va.....	55.3	48.0	58.0
Westmoreland.....	54.9	37.4	63.8
Virginia.....	54.8	36.8	64.6
Harlan.....	53.3	52.8	55.1
Hazard.....	51.7	61.6	66.1
Pocahontas.....	49.8	59.0	61.4
Tug River.....	48.1	61.4	67.9
Logan.....	47.6	59.6	68.6
Cumberland-Piedmont.....	46.6	48.0	50.2
Winding Gulf.....	45.7	61.9	67.3
Kenova-Thacker.....	38.2	52.1	61.5
N. E. Kentucky.....	32.9	44.2	55.4
New River**.....	24.3	29.2	31.0
Union			
Oklahoma.....	63.9	59.4	64.7
Iowa.....	57.4	75.9	79.1
Ohio, north and central.....	52.6	44.8	47.9
Missouri.....	50.7	63.6	76.5
Illinois.....	44.8	52.1	58.6
Kansas.....	42.0	50.5	61.7
Indiana.....	41.4	51.9	59.0
Pittsburgh†.....	41.2	36.7	37.0
Central Pennsylvania.....	39.1	47.6	48.2
Fairmont.....	35.3	47.1	35.5
Western Kentucky.....	32.5	34.9	40.0
Pittsburgh*.....	30.4	28.1	31.8
Kanawha.....	26.0	13.6	12.6
Ohio, southern.....	22.9	24.3	29.1

*Rail and river mines combined.

†Rail mines.

**Union in 1921, non-union in 1922.

tons in the preceding week. Consumers are not stocking in anticipation of any shortage. The majority of the retailers have already made provision for what tonnage they wish to carry over after April 1 and the market has turned softer. In fact, were it not for the last-minute stimulation caused by some late dealer stocking the market would be very weak at this writing.

Steam coals have been stocked heavily by the larger users and the demand has softened. No interest has been shown as yet by Lake purchasers, as dock stocks are still large and are moving very slowly.

COKE

Beehive coke production registered another increase during the week ended March 11. The output was 154,000 net tons, as compared with 143,000 tons in the previous week.

Recent coke offerings were small, which accounted for the increasing prices over the past month. The poor demand for coal has eased the situation, however, and coke production is now adequate. The coke market has softened in the past week, although prices are not yet quotably lower.

Foreign Market And Export News

Hampton Roads Pier Situation

	Week Ended	
	March 9.	March 16.
N. & W. Piers, Lamberts Point:		
Cars on hand.....	2,533	1,598
Tons on hand.....	134,436	89,810
Tons dumped.....	122,795	158,087
Tonnage waiting.....	6,750	18,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand.....	1,424	1,690
Tons on hand.....	71,200	84,500
Tons dumped.....	125,909	93,418
Tonnage waiting.....	2,500	15,000
C. & O. Piers, Newport News:		
Cars on hand.....	1,375	1,234
Tons on hand.....	58,750	61,700
Tons dumped.....	60,719	85,377
Tonnage waiting.....	—	1,100

Coal Paragraphs from Foreign Lands

GERMANY—Production in the Ruhr region during the week ended March 4 was 1,838,000 metric tons, according to a cable to *Coal Age*, as compared with 1,978,000 tons during the preceding week. February production reached 7,750,000 tons and in Upper Silesia, 2,691,000 tons. Transportation was entirely disrupted by the railway strike and the freezing of waterways and has not yet returned to normal. Freight rates were increased about 20 per cent on March 1, and are now 32 times the pre-war figures.

ITALY—The price of Cardiff steam first is now 42s. 3d., according to a

cable to *Coal Age*. Last week's quotations ranged around 42s. 9d.

Export Clearances, Week Ended March 16, 1922

FROM HAMPTON ROADS

	Tons
For Atlantic Islands:	
Dan. S.S. Rolf, for Bridgetown.....	2,712
Nor. S.S. Krosfond, for Castries.....	2,807
Nor. S.S. Bur, for Fort-de-France....	6,312
For Brazil:	
Br. S.S. Collingham, for Buenos Aires.....	5,491
Am. S.S. Robin Hood, for Rio de Janeiro.....	8,385
Br. S.S. Sallust, for Rio de Janeiro....	2,026
For Canada:	
Am. Schr. J. Edward Drake, for Hamilton.....	1,120
For Cuba:	
Nor. S.S. Porsanger, for Havana.....	6,408
Nor. S.S. Anna Sofie, for Havana.....	2,988
Nor. S.S. Tosto, for Cavenas.....	1,004

FROM PHILADELPHIA:

For Brazil:	
Br. S.S. West Gambo, for Rio de Janeiro.....	

INFORMATION RELATIVE TO POSSIBLE COAL MARKETS can be obtained by consulting "Foreign Trade Opportunities" *Commerce Reports*, issue of March 13, 1921, Nos. 1031, 1038, 1046, and 1065.

British Benefit from Strike Talk Here; French Industry Needs Lower Costs

Production in Great Britain decreased slightly during the week ended March 4, according to a cable to *Coal Age*. The output was 5,039,000 gross tons as compared with 5,047,000 gross tons during the previous week, the high mark for the year.

South Wales market activity is not affected by the engineers' lockout demands. The impending labor trouble at American mines is strengthening the call and all export markets are improved.

Exports during February continued to increase. The total shipments were 5,014,000 gross tons as compared with 4,020,935 tons in January, and 4,309,162 tons in December. Exports during February a year ago were only 1,728,000 tons.

Ascertainment of the mining industry in January, which fixed the wages for March, shows the wage percentage to be 61.71 per cent above the basis rates, or a drop of 10 per cent on the previous month. Wages, however, are unchanged, as under the National Agreement they cannot fall below 89 per cent.

French Coal Trade in Serious Shape; Coming Reductions Will Help

The industrial crisis persists, and the slight improvement marked from November to January again seems to be something of the past. On top of this, competition of British coals is getting sharper.

Industrial coals are, if anything, even in less demand, and sometimes offers are made at as low as 90 fr., delivered. The Collieries in the Nord, in order to get rid of the huge stocks have again established price reductions according to quantities lifted; they vary from 50 centimes per ton up to 500 tons to 2 fr. for quantities between 1,500 and 2,000 tons. In certain cases reductions of 3 and even 4 frs. are paid on industrial coals.

Wage reductions which will be enforced from April, will permit a drop of about 8 fr. per ton. A bill has been lodged with the House of Commons to permit exceptions to the 8-hour act in the mining industry.

The Minister of Public Works has also asked public utility enterprises to use French coals whenever possible instead of foreign coals, and it has been decided that the latter will only be used when their c.i.f. price is more

than 10 fr. lower than the cost of French fuel. Reductions in rail-freights are also being arranged.

British Coal Exports, January, 1920, 1921 and 1922

Country	Gross Tons		
	1920	1921	1922
Russia.....	4,215	19,495	19,495
Sweden.....	164,180	40,672	116,509
Norway.....	119,391	44,035	112,332
Denmark.....	175,651	71,651	190,786
Germany.....	479	14,393	247,313
Netherlands.....	82,031	83,807	294,538
Belgium.....	68,995	13,847	253,375
France.....	1,622,663	565,405	1,172,544
Portugal.....	53,820	25,986	58,401
Azores and Madeira.....	9,846	2,384	9,099
Spain.....	36,279	116,154	132,053
Canary Islands.....	28,168	2,686	24,680
Italy.....	363,420	308,318	481,495
Austria.....	44,766	.....	.....
Hungary.....	.....	.....	.....
Greece.....	35,680	22,886	61,227
Algeria.....	40,181	20,764	92,557
French West Africa.....	19,074	15,208	8,865
Portuguese West Africa.....	46,306	14,992	9,150
Chile.....	957	10,759	4,528
Brazil.....	50,981	436	31,401
Uruguay.....	29,892	19,306	46,023
Argentina.....	82,361	22,757	121,866
Republic.....	8,446	18,115	13,847
Channel Islands.....	85,204	22,669	64,313
Gibraltar.....	35,499	19,172	8,863
Malta.....	94,652	82,797	115,540
Egypt.....	.....	.....	.....
Anglo-Egypt, Sudan.....	.....	.....	.....
Aden and Depend.....	6,019	10,836	.....
British India.....	110	104	168,743
Ceylon.....	.....	6,082	25,459
Other Countries.....	49,306	134,721	125,097
Total January.....	3,358,572	1,700,106	4,020,935
Total December.....	2,302,076	4,309,162	.....

AMOUNT AND VALUE

	Quantity (Tons)		
	1920	1921	1922
Anthracite.....	180,685	132,427	155,949
Steam.....	2,785,532	1,295,242	3,143,858
Gas.....	262,183	210,235	501,723
Household.....	7,152	8,141	38,344
Other sorts.....	123,020	54,061	181,061
Total.....	3,358,572	1,700,106	4,020,935
	Value		
	1920	1921	1922
Anthracite.....	£484,954	£488,019	£355,369
Steam.....	9,733,717	4,182,295	3,616,099
Gas.....	891,810	687,277	578,393
Household.....	21,284	28,915	47,799
Other sorts.....	410,372	169,202	185,879
Total.....	£11,542,137	£5,555,708	£4,783,539

United States Coal Exports in 1921

Exports of bituminous coal from the United States during 1921 amounted to 20,652,788 gross tons, valued at \$122,596,704, according to a report of the Fuel Division of the Department of

Commerce. This was a decline of 40 per cent, as compared with the 1920 exports, which were 34,390,254 long tons, valued at \$304,273,241. These figures do not include bunker coal laden on vessels engaged in the foreign trade, which in 1920 aggregated 9,362,178 tons and in 1921 7,547,518 tons.

The decrease in 1921 was divided mainly between France, Netherlands, Sweden, Canada and Argentina. Of the total exports of soft coal, 12,483,550 tons or 61 per cent went to Canada. The 1921 exports, while below those of 1920, were nevertheless 300,000 tons above the average of the past nine years. Exports to Canada were 500,000 tons below the nine-year average and to other countries 1,000,000 tons above it.

Anthracite exports were 4,176,221 gross tons, about 650,000 tons less than in 1920. Coke exports declined 66 per cent from the 1920 figure, 1921 being 273,888 tons as compared with 821,252 tons in 1920.

Less Coal at Hampton Roads

Business has been brisk in the face of the impending coal strike. Coastwise movement is on the increase, while a slight revival in foreign shipments occurred last week. Dumpings were not increased to any extent in volume. But the number of orders filled was greatly in excess of the previous week. Accumulations at Tidewater have decreased, while vessel tonnage awaiting cargo has piled up.

Prices are stronger this week, and the tone of the market is firm. The greater portion of the tonnage moving is on contract, particularly for bunkers. A general tone of optimism pervades the market.

Pier and Bunker Prices, Gross Tons

PIERS			
	March 11	March 18†	
Pool 9, New York.....	\$5.50@5.75	\$5.45@5.75	
Pool 10, New York.....	5.20@5.40	5.15@5.40	
Pool 9, Philadelphia.....	5.50@5.85	5.50@5.85	
Pool 10, Philadelphia.....	5.20@5.60	5.20@5.60	
Pool 71, Philadelphia.....	5.70@6.00	.....
Pool 1, Hamp. Rds.....	4.60	4.50@4.65	
Pools 5-6-7 Hamp. Rds.....	4.15@4.25	4.30	
Pool 2, Hamp. Rds.....	4.45	4.55	
BUNKERS			
Pool 9, New York.....	\$5.80@6.15	\$5.75@6.05	
Pool 10, New York.....	5.50@5.70	5.45@5.75	
Pool 9, Philadelphia.....	5.90@6.10	5.85@6.10	
Pool 10, Philadelphia.....	5.60@5.85	5.50@5.85	
Pool 1, Hamp. Rds.....	4.75	4.80	
Pool 2, Hamp. Rds.....	4.55	4.70	
Welsh, Gibraltar.....	38s. f.o.b.	40s. 6d. f.o.b.	
Welsh, Rio de Janeiro.....	55s. f.o.b.	55s. f.o.b.	
Welsh, Lisbon.....	40s. f.o.b.	40s. f.o.b.	
Welsh, La Plata.....	50s. f.o.b.	50s. f.o.b.	
Welsh, Genoa.....	39s. t.i.b.	42s. t.i.b.	
Welsh, Messina.....	36s. t.i.b.	38s. t.i.b.	
Welsh, Algiers.....	34s. f.o.b.	37s. f.o.b.	
Welsh, Pernambuco.....	62s. 6d. f.o.b.	62s. 6d. f.o.b.	
Welsh, Bahia.....	62s. 6d. f.o.b.	62s. 6d. f.o.b.	
Welsh, Madeira.....	40s. f.a.s.	38s. f.a.s.	
Welsh, Teneriffe.....	40s. f.a.s.	38s. f.a.s.	
Welsh, Malta.....	40s. f.o.b.	42s. f.o.b.	
Welsh, Las Palmas.....	40s. f.a.s.	40s. f.a.s.	
Welsh, Naples.....	39s. f.o.b.	38s. f.o.b.	
Welsh, Rosario.....	52s. 6d. f.o.b.	52s. 6d. f.o.b.	
Welsh, Singapore.....	55s. f.o.b.	55s. f.o.b.	
Port Said.....	46s. 6d. f.o.b.	40s. 6d. f.o.b.	
Belgian, Antwerp.....	30s.	30s.	
Alexandria.....	45s.	47s.	
Bombay.....	38 rupees	38 rupees	
Cepetown.....	39s.	39s.	

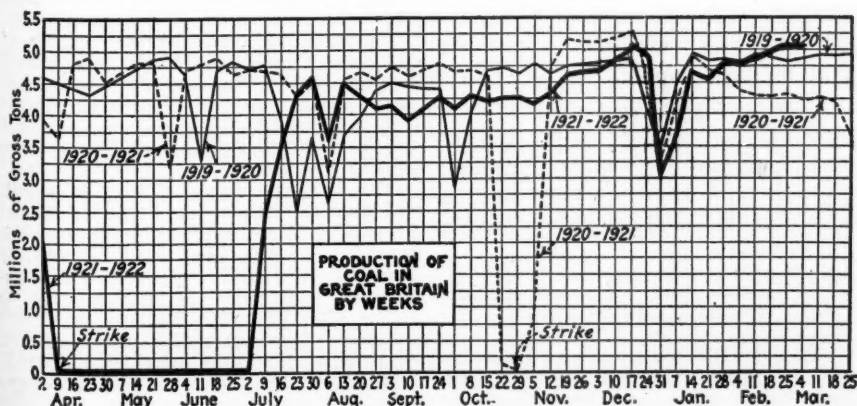
Current Quotations British Coal f.o.b.

Port, Gross Tons

Foreign Quotations by Cable to Coal Age

	March 11	March 18†
Cardiff.....	27s. @ 27s. 6d.	27s. @ 27s. 6d.
Admiralty, Large.....	19s. 6d. @ 20s.	19s. @ 20s.
Steam, Smalls.....	.....	.....
Newcastle:		
Best Steams.....	25s.	25s.
Best Gas.....	24s.	24s. @ 25s.
Best Bunkers.....	23s. @ 24s.	23s. 6d. @ 24s.

†Advances over previous week, shown in heavy type; declines in italics.



North Atlantic

Non-Union Coal Contracts Offered in Greater Number

Will Continue While Current Market Lags—No Apprehension Felt as April Approaches—Requirements Safeguarded—Evidence Seen That Supplies Will Be Available.

CONSUMER interest is waning and market prices have weakened in the past few days. Requirements have been quietly safeguarded and there is no apprehension felt over the strike outlook due to the possible inability to secure what little tonnage may be needed after April 1. The flow of non-union coal is convincing evidence that coal will be available when needed.

Contract offerings of non-union tonnage are increasing and will continue to do so as long as the current market lags. A larger number of loaded boats in New York harbor tends to strengthen boat rates.

BALTIMORE

Consumers are refraining from active staring in the face of the strike. The belief that the non-union mines will continue to produce, in conjunction with coal already above ground, enough fuel to take care of a possible period of strike and the present light call for fuel needs of the nation all have an effect in holding down buying. Prices are very weak.

A conference in Baltimore, March 13, between the northern West Virginia operators and representatives of the mine workers, District No. 17, was unfruitful of immediate results as the mine workers unexpectedly announced that they could not discuss the wage question without further authority. The conference was then adjourned until the middle of this week when another attempt to adjust will be made through a meeting in Baltimore.

PHILADELPHIA

Despite the fact that everyone has admitted that trade has been extremely quiet for the past few months, yet much of the coal shipped has been in excess of current needs and is now in stock. The tonnage of the past month compares well with the production of the years before the war.

Each day the belief grows that the only ones liable to feel the strike, at least for a month or two, will be the union operators. Lately there has been an increase in the tonnage offered to big concerns on a contract basis. If the spot demand does not strengthen there will be a further influx of contract offerings. Some good coals have recently been offered on a contract basis for limited tonnages at \$1.80@\$2.

There has been just the least sem-

blance of a flurry in the spot market lately by a few concerns deciding at the last moment to lay in some reserve, and who endeavored to get immediate shipment.

NEW YORK

Consumers are not excited and buying is generally lighter than a few weeks ago. There are more cars at the local piers but most of this is on contract or for public utilities, and spot offerings are lighter.

There is considerably more strength in the demand along the line than at Tidewater, although prices are about on the same basis. It is conceded that with current needs no greater the non-union fields will produce sufficient coal to take care of the immediate situation.

There is a tendency among non-union mines to close some contracts and quotations on a basis of \$2.20@\$2.35 for Pool 10 have been reported. Higher grades are being quoted up to \$2.75, subject to wage adjustments.

Southern coals coming into the harbor at present are mostly for public utilities.

New England

Ask High-Volatile Bids

Roads Flooded with Offers

Market Unimproved—Few Openings for Shippers—Numerous Distress Cargoes Disturb Prices—Marine Freights Soften—Reserves for 90 Days on Hand.

THE New England market shows no improvement. There are few openings in sight for shippers. The textile tie-up is reducing the tonnage needed and various other industries see no early increase in their fuel requirements. Distress cargoes are becoming numerous and lower prices have resulted. Marine freights have softened and this presents the only inducement for consumers to lay in additional reserves, which now range up to 90 days' supply.

Some railroads are asking bids on high-volatiles and this is bringing a flood of offers. Pennsylvania grades are quiescent except where special price cuts are made to compete with coastwise tonnage.

Both all-rail and by water receipts lately have made a better showing, but this is to be attributed to buying some weeks ago rather than to any improvement in current demand. Spot quotations have sagged again because of

FAIRMONT

Conditions remain much the same. Not more than 100 mines out of the 500 or more in the northern part of the state were in operation at any time during the week ended March 11. Tidewater shipments were somewhat heavier, but railroads were not buying on quite so large a scale.

CENTRAL PENNSYLVANIA

Two highly important developments marked the proceedings of the U. M. W. convention at DuBois last week. One was the adoption of a scale patterned after the demands voted at the international convention at Indianapolis. The other vital feature was the receipt of an invitation from the Association of Bituminous Coal Operators of Central Pennsylvania, asking the convention to appoint a scale committee to sit in joint session with a committee of the operators' association.

UPPER POTOMAC

Miners averse to any reduction are endeavoring to prevent those who have accepted lower wages from going to work by picketing and parades and in some instances are succeeding. Although there has been no general adjustment of wages in the district enough miners have returned to work at lower wages to increase production somewhat. Prices are a little stiffer and that is helping to some extent.

light request, and are shown in the Weekly Review.

The textile strike is only one factor in a very dull situation. Shoe manufacturing and other industries are sharing much the same dullness and there is an utter lack of snap that makes the current steam coal market abnormally quiet.

The surplus of marine transportation is again making itself felt. Rates of \$1 flat have been named on steamers from Hampton Roads to Boston, and it is easy to predict the same level for barges of 2,500 to 3,000 tons.

At Boston there is still an amount of "distress" coal to be forced on reluctant buyers. On one steamer, about 7,500 tons, \$1.10 demurrage was paid, due not to lack of handling facilities but to a market that was practically flooded with spot coal. Under such pressure prices on cars Boston have receded to \$6.15, and in some instances to \$6.

Contract requirements of certain of the New England railroads have caused a mild stir in the trade the past few days. Bids are asked on high-volatile and it is said that every coal man east of the Ohio River is out for a share of the tonnage.

Pennsylvania grades are quiescent. A few operators have made special prices for March shipment, but for the most part little is heard from the Pennsylvania fields. The somewhat increased movement is due largely to extra efforts on the part of producers to start forward unfilled balances on last year's contracts to which both railroads and other consumers stand committed.

Anthracite

Output Gains Slightly, Due to Last-Minute Demand

Retailers Avert Precipitous Decline in Domestic Market—Dealers Provide for Strike Carry-Over Seldom in Excess of 45 Days' Needs—Householders Indifferent.

PRODUCTION shows a slight increase. This is due, however, to a last-minute demand by some retailers, which has saved the domestic coal market from a precipitous decline. Dealer's stocks are far from being at capacity, but the majority of them have already made provision for what tonnage they desire to carry over—in only a few cases in excess of 45 days' requirements.

The householder continues to eke out his season's needs with small orders. Steam users are becoming well-stocked and the movement of these sizes is slowing up. Lake business has made no stir, as the Head-of-the-Lakes trade is having difficulty in moving supplies on hand.

BOSTON

While there is only a moderate demand, there is an evident shortening in supply. Producers are now turning down orders that are offered them, and even those companies who were easy on supply the first half of the month have now accumulated about all the boats they can be certain of clearing with March coal.

Retail demand continues light. Relatively very few householders are taking in coal for next winter; most people seem satisfied to wait until the hoped-for reduction is operative.

In larger cities there is more disposition to carry ninety days' retail supply. In smaller cities a six weeks' supply is about the average provision being made.

ANTHRACITE FIELDS

Practically nothing but the wage settlement is talked about in the region. Only a very few optimists predict that there will be no tie-up and it is a foregone conclusion that if there is no strike there will be an automatic suspension due to lack of demand.

Nearly all the mines have recovered from the wet spell of last week. The steam-shovel stripping engineers in the Hazelton field have settled their differences and the men have returned to work.

PHILADELPHIA

Retail purchasing has been moderate, but only because of the probability of a mine suspension on April 1.

News from the conferences between

miners and operators has been far from definite and the retail men are still endeavoring to guess the outcome. All are buying a good excess over current deliveries, but as yet there is no yard with a capacity stock, and there is no likelihood that there will be.

Some dealers who had postponed adding to their stocks found last week that they had delayed too long, especially when they desired stove and nut. Despite this strengthening of demand there has been no increase in prices by independent shippers.

Steam sizes are unchanged, with buckwheat in good demand, barley extremely so, and rice more or less quiet. Big users are prepared for a shut-down of several months. In addition, they have a feeling of confidence based on the heavy stocks still in storage. However, railroads without heavy accumulations of coal will have first call on this tonnage in the storage yards.

BALTIMORE

An abrupt curtailment of the late ordering, stirred by warnings of possible conditions of a hard coal strike, came toward the close of last week. Dealers are much interested in the possibility of the Maryland legislature passing the 2,000 pound net ton law to replace the present gross ton law requiring the delivery of 2,240 pounds.

A warm contest has arisen on this subject with considerable misrepresentation from sources that have been warring upon the coal men lately. As the Merchants & Manufacturers Association has lined up behind the measure, however, it is hoped that the bill will be passed.

BUFFALO

Dealers have several weeks' stock on hand. The mild weather has lessened consumption. Independent prices show an easy tendency. The expectation is that business will be only moderately active during the remainder of the month. Dealers are being advised to have enough coal on hand to take care of requirements until at least the middle of May.

Leading shippers say they are not making any arrangements to load coal into vessels this month for the opening of navigation late in April. This season may, therefore, open late this year, making an active period toward the close.

NEW YORK

Consumers appear to have lost all interest in strike conditions and although advised by the retail dealers to put in at least enough coal to last them until warm weather sets in they have not been inclined to do so. Retail yards for the most part are kept well filled with the domestic coals and dealers are endeavoring to have sufficient on hand on April 1 to last them until May 1 at least.

It was reported there was a tendency on the part of some shippers in this

harbor to load boats in anticipation of next month's suspension.

Steam coal is not so active. Weather conditions have acted as a fuel saver. Early in the week there were nearly 40 boats of the poorer grades, mostly rice, lying in the lower Bay. The higher grades move easily but are in larger supply than a few weeks back.

Company coals are in better demand than the independent product and for that reason some of the latter coals are hardly bringing full company schedule.

Coke

UNIONTOWN

The coal market is quiet although there is some contract activity. Any increased demand that may come because of the union strike has long since ceased to figure in speculation and operators are now prepared to handle the orders, if they come, and will not be disappointed if they don't.

Sewickley steam is quoted \$1.30@ \$1.50; Pittsburgh steam, \$1.40@ \$1.50 and byproduct \$1.90@ \$2.

The coke market is inactive although prices are steady, there being but little demand and no tonnage without destination. Prices are: \$3.30@ \$3.50 for furnace and \$4.25@ \$4.75 for foundry.

CONNELLSVILLE

The coke market has turned easier, although prices are not definitely quotable at lower levels. The lack of strength is attributable to the decidedly softer conditions in the coal market, as coal of various grades has almost gone begging in the past week.

Prices for ordinary steam coal remain at \$1.50@ \$1.60, about as low as operators can go, considering cost. Byproduct is offered at \$1.60 and upward, depending on grade. A recent contract was at \$1.50, this being taken as backlog business, 1,000,000 tons for a New England railroad for 12 months.

The Lackawanna Steel Co. has contracted for 15,000 tons of furnace coke a month beginning April 1, at \$3.50 or a trifle less, to balance a possible deficiency in coal supply at its byproduct ovens on account of its mines being union.

Spot furnace coke is still quoted at \$3.50 but the odd lots to be picked up at \$3.25 have increased. Foundry continues in good demand, all signs indicating that foundries have been and are stocking some coke.

The *Courier* reports production during the week ended March 11 at 78,820 tons by the furnace ovens and 47,140 tons by the merchant ovens, making a total of 125,960 tons, an increase of 13,250 tons.

BUFFALO

Not much coke is being offered and the output is said to have been much curtailed. A scarcity is reported in Connelville foundry, which is quoted \$4.50@ \$4.75, with furnace at \$3.25@ \$3.50. The larger sizes in crushed coke are in fairly active demand and prices are firm. A little surplus exists, however, in chestnut coke. To the above prices is to be added \$3.64 for freight.

Chicago and Midwest

Eastern Coal Streams In; Price Advance Unlikely

Inquiries Heavier — Current Demand Improves, but Market Is Still Tight— Demand Is Only for Steam Coals— Railroads Stocking in Cars.

LAST-MINUTE inquiries are heavier and there is some improvement in current demand, but the market is still very tight. The number of orders placed is insignificant when compared with the tonnage available. Eastern coals are flowing in so heavily that prices are being shaved to avoid demurrage. Indiana and Illinois operators are loading every car available and indications are that April 1 will find a heavy tonnage on track. These sources, coupled with the good non-union supply, will easily absorb any late rush to cover that consumers may make, and at the same time keep prices from much of an advance.

What little demand exists is for steam coals. Railroads are still actively in the market and are storing coal in cars. Domestic tonnage is very slow and some producers are crushing the larger sizes. Price cuts on domestic coals have little effect, as neither the retailer nor the householder shows much inclination to make further provision against the strike.

All through the week selling organizations have been looking for a pick-up especially among the iron, brick, glass and automobile plants. They have been rewarded by a good many inquiries from these sources and a number of small orders but the market remained so definitely in the hands of the buyer that the business of selling coal continued unpleasant. Prices on a good many prepared sizes tended downward so that about every buyer on the market, shopped around and got it at about his own price. Steam demand was fair enough and lump and egg demand was poor enough, to cause the Peabody Coal Co., the biggest Illinois producer, to install and put into operation a crushing plant at one of its mines.

With the strike only two weeks away, the trade, at the end of the week, finally began to show some slight concern. Three of the biggest operators in Chicago had a number of inquiries from heavy consumers asking for prices on coal to be delivered during the period ending with the night of March 31. In most cases no quotations were made, the companies claiming that the time has come for day-to-day prices because anything might happen between now and the mine suspension.

Selling agencies were watching closely last week to see who was contracting for Eastern non-union coal to be distributed through the Midwest region. It was reported that Midwest railroad yards were beginning to fill up during the last day or two of the week with this coal, so that even a good sized last-minute buyers' rush could easily be absorbed.

At the end of the week there was no noticeable checking of production. "No bills" at the mines were increasing but there was no stocking on the ground. One or two railroads were advising mine owners to produce every ton they could and put it on wheels. However, it is thought probable that miners themselves will take a hand in curtailing production even before the strike. Many are expected to quit work almost any time. So the coming week may see the banner production of the winter, if operators try to get a quantity of coal out before this slack-off starts.

CHICAGO

The market continued at its abnormally low ebb last week, showing no change until Friday and Saturday when there was a slight strengthening in the demand for steam. Eastern non-union coals ran into the city in a good sized stream, giving such concrete evidence that the non-union fields will care for the strike period that stocking did not cut much of a figure.

There is so little business for anybody that there was a good deal of price shading on prepared sizes on the part of a number of companies even though a determined effort is made to keep quotations generally from going into a slump. Company prices on such coals as southern Illinois prepared sizes continue at \$3.25@3.65 and central Illinois, \$2.65@3 but part of the business done in those same coals was at prices ranging 25c. or 30c. below the scale, and as the week closed, declines of 10c. a ton all around were common though a few companies maintained that their prices were already flat against rock bottom and that they would rather not sell at all than to undercut the circular.

The retail demand picked up ever so slightly during the latter half of the week because of the cooler weather, leaving dealers praying for at least another week of cold. The average householder's coal bin is practically empty.

SOUTHERN ILLINOIS

In spite of the fact that the strike is two weeks off there is little or no activity except on screenings. There is more doing in the Cartersville field than in the others, but even here, most mines that are working only run two or three days a week.

Railroad tonnage is good and will continue so to the end of the month. It is likely as the end approaches that steam sizes will get better. Considerable dissatisfaction exists among the miners and in some parts of the field there is much destitution. All miners are in

favor of a strike to maintain the present scale.

In Perry and Jackson counties somewhat similar conditions exist, except that four days are the limit on working time. Railroad tonnage is not good in this field.

Mt. Olive is working a trifle better, mostly on steam and railroad coal. Domestic is slow, with steam sizes going altogether on contract.

The Standard field shows no change. While railroad tonnage has picked up some domestic and steam seem to have fallen off and prices continue to slip. Screenings are in comparatively good demand.

LOUISVILLE

Although a strike apparently is inevitable the buyers are listless. Many large users are well stocked.

A strike is not expected to slow down things much in Kentucky, as most of eastern Kentucky is non-union, or the unions are not recognized, and workers are anxious for a chance to work. In western Kentucky one union section is on a non-strike contract with a year to run.

Coal today is to be had almost at the buyer's own figure, as eastern Kentucky mines are working on a much lower wage scale, and need business. Unless a strike develops a very slow market is in prospect for the next several weeks. The weather is too mild to create much demand for domestic sizes, although retailers are doing a little business, but principally from stocks on hand. Screenings are expected to tighten up shortly as a result of the small production.

WESTERN KENTUCKY

General demand has been poor. Screenings are not in the call that they were, but are moving. Production of lump is very light.

Industrial consumers appear to have stocked up fairly well. Some of them have been forced to hold up shipments. Railroad buying has been a little better.

In western Kentucky there are two operators' associations, one of which has a contract that has a year to run. This one field will probably be quite active during the closed period. It is understood that the contract carried a no strike clause, with the wage to be on the basis then in effect, but to be scaled according to any decision which might be reached by the United Mine Workers with other districts later on.

ST. LOUIS

Contrary to all expectations, business is dead. Domestic orders are almost unknown. There is some little movement on coke, largely experimental, on account of propaganda work. Hard coal is slow.

In the country sections the domestic call is easy, not much going into storage and what little is moving is cheap coal. Other years at this time the domestic demand for storage coal has been heavy.

Steam business locally is slow. It is probable, however, as April 1 approaches prices will go up and demand become greater when the public generally realizes that the strike may develop into something beyond the shutdown of a few weeks.

Northwest

Prices Firm as Strike Nears; Supplies Ample for Season

Suspension Will Enable Dock Men to Dispose of Higher-Priced Coals and Restock Under New Conditions—More Coal Moving—Buyers Still Hesitant.

PRICES are holding firm as the strike approaches. Dock men figure the coming suspension will afford an excellent opportunity to dispose of their high-priced stocks and allow them to refill their storage space under the new conditions after the strike. Coal supplies are more than ample for the balance of the season but a prolonged suspension would narrow the period during which Lake coal could be shipped, and restocking would thus be done under unfavorable conditions.

More coal is moving but the buyer is fluctuating between a desire to take only current needs and the possible need of reserves in excess of the season's requirements. Large users are the most active buyers at the present time, the smaller consumer generally delaying until a later date before taking in any tonnage that is not urgently needed.

MILWAUKEE

The weather thus far in March has been mild and spring-like and in consequence, the movement of coal from the docks is slow. City demand is light and orders from the country are not up to normal.

Some speculation is indulged in as to the probable drop of prices on April 1, but in view of the impending strike with its disturbance of the coal supply, buyers do not seem to be inclined to hold back for the small amount that may be involved. The supply of anthracite is fair and there is plenty of Pocahontas to be had. Soft coal screenings are not as plentiful as usual, but this is not a serious matter, as other grades of steaming coal are available. Prices of coal and coke remain undisturbed. There is an increased demand for the latter, following the recent cut of \$2 per ton.

DULUTH

Business during the winter months of January, February and March will exceed the average of the same three months for the last ten years, according to predictions made by coal men here. The reason for the increase is that retail dealers last fall failed to place sufficient orders to carry them to the opening of navigation, and are now endeavoring to get enough coal in to fill their needs. Public utilities and railroads are also taking large tonnages in anticipation of the coal strike.

A dock survey just completed puts the bituminous coal tonnage at 3,300,000 and anthracite at 500,000. These figures show a comfortable margin before the opening of navigation but are not reassuring in view of a prolonged strike.

Prices are maintaining their strong tenor. Youghiogheny screenings are especially strong, selling at \$4.75. In hard coal there is a shortage of stove; ample nut and pea, and a surplus of buckwheat.

Two docks have announced that their stocks will be cleaned up by the opening of navigation. These are the Carnegie and Northwestern.

The whole leaning here is toward strong optimism on the part of dockmen and dealers. Complaint against high prices, which was heard early in the season from consumers, has almost died away, it being evidently well established in the public mind that any excess in prices comes from high overhead and wages at the mines.

MINNEAPOLIS

The coal trade has been fluttering between having to buy for current demands and fearing to stock up in excess of what will be needed for the remainder of the winter. The commercial situation is nearly the same. What little difference exists is in favor of the present winter, which would mean a little more outlet for coal in industrial lines.

Buyers of coal for retailing or for distributing to the steam trade are trying desperately to meet the unknown condition of being supplied for reasonable needs without stocking beyond the time that new season's prices (expected to be at a much lower level) are available. There is ample coal on the docks for some months to come. The danger to the Northwest will be wholly if the suspension endures until far into the summer, and the restocking of the docks has to come into competition with the demands from all other sections. People in the trade rather regard the suspension, if it comes, as being likely to help clean up high-priced coal in dealers' bins and yards, and to some extent on the docks. The dock prices always follow the general market. Buying during the next few weeks will be at a minimum but there will be some forehanded buying by those who have very little in store.

One thing which would stimulate the movement of coal more than all else, is the revival of business activity, which seems to be on its way. Things have been depressed for a long time, but are on the mend, and the turn seems to be well established. Farm products have been at a minimum price for months, but are increasing in price. Slowly, the costs of many commodities which the farmer must buy, are declining, and thereby getting closer to the standard established by his income. These conditions have served to help matters materially in sentiment. People are getting over the worst of their feeling that dense, black depression is and of necessity must cover the whole earth. They are beginning to seek the answer wherein they may find some

means of trading under conditions as they now exist. And as they pursue this line of thought, better things are due with all concerned, including the coal trade.

South

BIRMINGHAM

With a more active inquiry for steam coal and some increase in business being taken on, there is a more hopeful feeling pervading the ranks of the coal men. Spot sales show an improvement and negotiations are under way for the renewal of industrial contracts, quite a number of which expire April 1. The L. & N. has sent out proposals for its coal supply for another year and bids are now in course of preparation.

The movement has increased materially in the past week. The Frisco is stocking heavily, taking the entire output of some of the Walker County mines at which contracts are held. The L. & N. also increased its contract allotments again the past week, while the Southern is taking a much heavier tonnage. To this may be added the improvement in the industrial and utility demand and the large amount of coal being transported for coke-making.

There is no change to be noted in the domestic trade. Lump coal is difficult to dispose of and there is a surplus on the rails. Some producers are throwing it on the steam market as a final resort.

Both steam and domestic quotations are more stable than for some time back, and there is little likelihood of prices going to lower levels. Rather there is a disposition to stiffen commercial figures. Schedules quoted the past week represent the prevailing prices at this time.

VIRGINIA

There was a slight drop in production during the week ended March 11. This loss was due to a slackening of the steam demand. Despite the drop in production some plants heretofore in idleness have resumed operations. Prices are a little lower. There is more inquiry for coke but only about 6,000 tons of coal a week are being utilized at this time.

Canada

TORONTO

The impending strike appears to have little influence upon market conditions here. The public seems to have the impression that prices may come down.

As the dealers have large stocks on hand, bought at a high figure, no drop is likely to occur in the near future. The principal consumers of bituminous have sufficient stocks on hand to meet their present limited requirements for some time.

Quotations are as follows:

Retail,	
Anthracite, egg, stove and nut.....	\$15.50
Anthracite pea.....	14.00
Bituminous steam.....	\$9.25@ \$9.75
Domestic lump.....	11.25
Cannel.....	16.00
Wholesale, f.o.b. cars at destination:	
1 in. lump.....	7.00@ 7.75
Slack.....	6.00@ 6.75

Eastern Inland

Increased Production and Stocking Weaken Prices

**Consumers, Indifferent to Approach of
Strike, Stay Out of Market—Will
Rely on Present Stocks and Non-
Union Producers.**

GREATER production and consequent stocking has been the cause of a weakening of prices on the Eastern Inland coal market. Consumers are more indifferent in the face of the approaching strike and the general tendency now is to stay out of the market, relying on present stocks and the non-union suppliers after April 1. Inquiries are more numerous, however, and it is plain that the consumer wants to know where he can lay his hands on coal when it is needed.

Railroads and public utilities are the only active factors in the market today. The carriers are not only storing coal in the usual manner but some have put "bad order" cars in sufficient repair to get them under load and on track.

CLEVELAND

The bulletin of the Cleveland Trust Co. for March declares that industrial coal consumers are viewing the approaching strike with no apprehension, in view of stocks sufficient for about six weeks and prospects of a substantial flow of coal from non-union mines.

A survey in Cleveland reveals that, with promised production from the non-union fields, a shortage is improbable. Public utilities are well stocked and the city has just authorized the expenditure of \$500,000 for the purchase of coal against the strike. The Cleveland Electric Illuminating Co., has a supply of 200,000 tons on hand, sufficient for 100 days. The average daily consumption of 2,000 tons is being offset by fresh deliveries and by April 1, the 100-day supply will be intact.

The municipal water and light plants have about 25,000 tons in storage or sufficient to last for 70 days. Other city departments are equally well protected. Stocks in retail yards are sufficient to supply all demands for the remainder of the season. The New York Central has enough coal stored in this section to last for 35 days. Industrials are buying more coal as a result of greater plant activity, but little storage against the strike is apparent. Inquiries are numerous, however, and it is clear that users are anxious to know where they can put their hands upon supplies when they need them.

The steamer Leopold arrived at Sandusky a few days ago from Cleveland, loaded with coal and cleared for Chicago. This is the first movement of the season.

DETROIT

Wholesale dealers and jobbers report there is only a moderate volume of buying. Despite the apparently wide divergence between the demands of the workers and the position of the employers, some of the local consumers are expressing a belief that no long strike will develop. The strongest retarding influence, however, is the generally unsatisfactory condition of business.

Household buying has diminished with the passing of wintery temperatures. Many of the retail dealers are holding large stocks.

West Virginia 4-in. lump is quoted \$2.50, 2-in. lump, \$2.25, egg, \$2, mine run, \$1.50, nut and slack, \$1.30. Ohio 3-in. lump is \$2.75, 1½-in. \$2.50, egg, \$2.25, mine run, \$1.85, nut and slack, \$1.50. Pittsburgh No. 8 1½ in. is \$2.35, ¾-in. lump, \$2.15, mine run, \$2, nut and slack, \$1.85. Smokeless lump and egg is \$3.25, mine run, \$2, nut and slack, \$1.50.

BUFFALO

The market shows no improvement. Consumers have ample stocks to carry them for at least a month, and, as they anticipate a reduction in prices, as well as freight rates, they are unwilling to make any purchases.

Business activity does not appear to be increasing to an extent sufficient to cause alarm over the depletion of coal stocks, and there is a general feeling that non-union mines will be able to take care of the requirements of consumers for some weeks.

The annual inquiry for coal on contract for municipal and other large institutions is now being made. Under present conditions, however, the authorities are not likely to be satisfied with the results of their advertising, and the coal men are not in position to quote intelligently a year ahead.

COLUMBUS

Only occasionally a large order is being booked, where the purchaser is desirous of accumulating stocks. Buyers as a rule are somewhat anxious to talk contract but producers and shippers are holding off until labor troubles are ironed out.

The principal demand is still for steam grades. Screenings are moving in fair volume but in certain sections they are scarce because of the curtailed production of lump. Railroads are buying both for storage on track and for accumulating in reserve stocks at certain junction points. A survey of the situation in Ohio shows that most steam users have supplies for 60 to 90 days and consequently they are not worrying.

Domestic trade is extremely slow. Dealers' stocks are adequate for the present. Retailers are devoting their time to cleaning up and as a rule are loath to accumulate heavy stocks at this time. Consumers are only buying sufficient coal for the remainder of the winter. Retail prices are fairly stable at former levels, with some cutting to force trade.

PITTSBURGH

There is no expectation that officials of the local district of the U. M. W. will take any practical action in response to the formal invitation of the Pittsburgh Coal Producers' Association that a meeting be held to negotiate a local wage agreement. The more common guess is that breaks from the union ranks will occur first on the fringe of the district, where some mines have turned non-union in the past few months. On the other hand there are bare possibilities of some sympathetic strikes occurring in the Connellsville region, where many union miners have been working of late.

The local market has turned remarkably soft. While most operators continue to quote former asking prices of \$2.10@2.20 for steam mine run, there have been sales in the past week as low as \$1.80, and \$1.90 has been a common figure. It is generally assumed that sales under \$2 are usually of coal mined under special wage conditions, although at mines formerly considered union, it being still believed that \$2.10 approximately represents cost under the U. M. W. scale. Connellsville coal has been very hard to sell, and ordinary coking coal has been offered down to \$1.60 in some cases, steam being commonly quoted \$1.50@1.60, this coal being at a freight disadvantage, as compared with Pittsburgh.

The conclusion in the trade as to the decrease in coal demand is that consumers were forehanded in laying in stocks and have in most cases now gone as far as they think necessary.

EASTERN OHIO

Notwithstanding the development of market inactivity generally, the output during the week ended March 11 was 390,000 tons or approximately 62 per cent of rated capacity. This is 6,000 tons above the preceding week and is greater than the output since the first week in November, at which time artificial market conditions also prevailed by reason of anticipated labor difficulties on the railroads.

The chief mainstay to production was the demand from the railroads. Carriers are making light repairs to "bad order" gondola equipment sufficient to permit a run to the mines for track storage purposes. It is claimed that the railroads will have at least a 60 days' supply ahead by the close of the month and some who have been storing on the ground as well as in cars, even more.

Although a coal strike on April 1 now appears inevitable, it has afforded little stimulus to activities in the trade. Demand tapered off during the week, and, if anything, now borders on dullness. Prices have softened slightly.

Receipts at Cleveland during the week ended March 11 amounted to 1,645 cars, divided 1,214 to industries, 431 retail yards; as compared with the total of 1,516 cars the preceding week.

NORTHERN PANHANDLE

Aside from railroad fuel shipments the only demand is from those few consumers who still continue to stock in anticipation of a strike. Mines running on a non-union basis are securing more business than organized operations. Owing to the uncertainty of the future, comparatively few contracts are being made.

Cincinnati Gateway

Heavy Stocks and Expected Cost Cuts Limit Buying

Steam Users Purchase for Requirements Only—Inquiries Active, Orders Few—Low-Volatile Shipments Too Heavy for Market—Prices Slipping.

THE approach of the date set for the strike has failed to keep buyers in a purchasing mood. Heavy stocks, the probability of mine cuts and freight reductions to come are causing steam consumers to question the wisdom of taking more fuel than is needed for current requirements. There is no dearth of inquiries, however, but actual orders are few.

Low-volatile shipments have been too heavy for the market and prices are slipping. Western points have an increasing tonnage on demurrage, as buyers appear to have satisfied their needs. The domestic market is stagnant while household buying has eased with the appearance of warm weather.

CINCINNATI

A combination of warmer weather and a stalled demand has overweighted this market to a point where price concessions are forced in order to stimulate business, but even with cuts on practically all offerings but steam coal there has been but little revival of the disposition to trade that was shown a month ago. Mails to most of the selling agents here are still burdened with inquiries but there is little "kick-back" in the form of actual sales.

The smokeless situation again was brought down a peg by the stagnation that followed the glut of coal thrown on the market to catch up with the orders a few weeks ago for prepared sizes. A cut on lump and egg has not produced more orders. Run of mine, too, has been stagnant. A few purchases by byproduct plants bolstered up the nut and slack situation and raised it to the dollar level and up.

Nut and slack and steam coal generally still has the center of the stage in the high-volatile division. Gas companies and utilities are the heavy purchasers. No word is being spoken on contract prices.

There has been no change in the retail prices. Business locally has fallen perceptibly and a revival of price cutting to end up the season is not unlikely.

SOUTHEASTERN KENTUCKY

Production and prices are being maintained. There is a good deal of anxiety being manifested over the strike situation.

About 20 mines in the Bell-Harlan fields have recently signed agreements with the 19th District, providing two years' work on the 1917 scale of pay.

This is the rate of pay in effect at most of the mines in this field at the present time. It now remains to be seen whether the balance of them will follow suit or endeavor to make separate contracts with their men.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

New River shipments have been so greatly in excess of the demand that there is more or less tonnage on the market without buyers, with the result that prices are weaker. Consumers appear to have stocked sufficiently to meet a strike situation.

Gulf mines continue to operate about four days a week, production being around 60 per cent of capacity, with labor shortage cutting down the output to some extent. Prices are virtually unchanged, with the demand for steam grades less brisk than it has been heretofore. There is comparatively little prepared call.

POCAHONTAS AND TUG RIVER

Railroad disability is affecting Pocahontas production to the extent of 25,000 tons a week. As it is, however, as much coal is being produced as at any time during the war period. Some of the tonnage is on demurrage in the West, owing to the fact that the supply is in excess of the demand. Steam markets are far below the usual pre-strike activity and quotations are somewhat weaker.

Tug River mines are holding their own from the standpoint of production, with approximately 100,000 tons moving each week. Even a slight weakening of the market for steam grades has failed to check production. An improvement in the steel business of course has something to do with the maintenance of production in this territory. Prepared is in light demand.

HIGH-VOLATILE FIELDS

KANAWHA

Kanawha mines are making no headway owing to a poor demand for virtually all grades. Prices are so low that operations are precluded at nearly all mines except where there has been a reduction of wages. Consumers, even including utilities, have secured enough coal to tide them over a strike emergency and in many cases are retiring from the market. Operators are preparing to adjust wages or at least to announce an adjustment, without regard to officials of the United Mine Workers.

LOGAN AND THACKER

Production in the Logan field continues at a rate of more than 300,000 tons a week. There is scarcely any demand for the domestic grades but producers are moving a large volume of steam coal although on the whole there is less market interest shown.

Williamson mines continue to produce more than 120,000 tons a week. The rate of output is 60 per cent of capacity or about the same as in smokeless territory. A car shortage is handicapping

producers to some extent. Railroads are securing a fairly large tonnage and contract coal is moving in good volume to utilities. The general demand, however, is not particularly brisk.

NORTHEASTERN KENTUCKY

As steam buyers become stocked for the strike they are dropping out of the market or at least reducing their requirements. There has been a decided recession in demand with a resultant weakening of prices. Even public utilities have ceased to buy on so large a scale. However, production is in excess of 55 per cent of capacity.

West

SALT LAKE CITY

Retail business continues good. The mines are doing as well as could be expected in view of the virtual closing of the Pacific Coast markets to Utah coal. Operators still find it difficult to obtain market for slack, but it is hoped that the industrial situation will soon be such that more slack will be consumed. There are already signs of renewed activity in the metal mining and smelting field.

DENVER

Operators of Colorado, while hoping to avert a strike, nevertheless feel that they will be involved if miners walk out in the Middle West in conformity with a proposed strike of nation-wide character.

Included among the demands—six-hour working day, double pay for Sunday and holiday work—of the several union camps in Colorado are those similar to the national demands. This is the inference drawn from a formal notice served on the Colorado State Industrial Commission that unless new agreements are reached a strike will be called April 1.

Cold weather has brought about a steadier market. Mine prices are about the same, bituminous lump bringing \$5 and \$10.25@10.75 at retail. Louisville lignite lump is \$4 at the mine and \$8 retail, while Weld County lignite is \$3.50 at the mine and \$7 retail. This grade, however, is selling as low as \$6.25 retail.

Lignite steam is bringing \$1@1.25 at the mine, and \$4@4.50 l.c.l. at destination, while Trinidad steam is \$2.25 at the mine and \$6.65 in small-lots delivered.

KANSAS CITY

There is little doing in the coal trade, as most all of the steam plants have put in stocks sufficient to carry them for from one to three months and with the non-union fields to call on, there is very little apprehension felt over the approaching strike.

There is a quietness that is ominous in view of the battle that will start April 1 and it is a safe bet that the cost of producing coal will eventually be lowered as until it is done the operators can make more money, or rather lose less, by not operating than by running their mines. No material change has occurred in prices from last week.

News Items From Field and Trade

COLORADO

The Colorado Fuel & Iron Co. reports for 1921 gross earnings of \$27,485,938, against \$51,812,813 in 1920. After all charges, including interest, depletion, depreciation and inventory adjustment, there was a deficit of \$2,731,172, against a surplus of \$1,286,806. After payment of dividends the deficit was increased to \$3,404,669. The profit and loss surplus on Dec. 31, 1921, was \$1,484,186, against \$5,118,026 at the close of 1920.

ILLINOIS

The holdings and property of the mine of the Kanawha Fuel Co., at Duquoin, are being sold by auction. The funds will go to pay off a debt owed to former employees of the concern.

The Manhattan Coal Co., Peoria, has announced its intention of sinking a new mine just east of Peoria. Work will be started as soon as weather conditions will permit and the mine will employ in the neighborhood of 150 men at the start.

The Columbia Coal & Coke Co., of Springfield, has announced the opening of new offices at Chicago, in the Transportation Building.

The Spring Creek Mine, one of the largest in the vicinity of Springfield, has been purchased by George Reisch from Frank Reisch and Albert Reisch. It employs about 350 men and has been working regularly the past six weeks.

A luncheon of the Chicago Wholesale Coal Shippers' Association was held at the Great Northern Hotel recently. Larry W. Ferguson, vice-president of the association, was the chief speaker.

The By-Products Coke Corporation, in its annual report for 1921, shows a net loss of \$1,295,235, after interest charges and adjustment of inventory. This compares with profits of \$702,145 for 1920.

The Central Illinois Public Utilities Co., which is in control of all the public utility plants in the southern Illinois mining fields, has taken option on several thousand acres of land on the Mississippi near Grand Tower for the purpose of building a dam on the order of the one at Keokuk. This plant will be supplemented by one or two boosting stations in the coal fields, such as the one now at Harrisburg, to take care of the peak loads.

There is a "mysterious stranger" among the coal men of Chicago. His name is C. W. Neff. Mail is continually received for him at suite 407 McCormick Bldg. and frequent callers there ask to see him. However, nobody has ever been ushered into his office and his mail is handled along with other "C. W. & F." correspondence. The name painted on the door of the suite is the well-known Chicago, Wilmington & Franklin Coal Co.

KANSAS

A 5-ft. vein of coal has been located on the Perry White farm, northeast of Parsons, and the owner intends to sink a mine shortly. The coal is 120 ft. deep with a good roof and the vein is 62 in. thick.

The Chamber of Commerce is urging the use of Leavenworth mined coal in a "trade at home" movement. There are 500 coal miners employed at present by the Leavenworth mines and the payroll averages \$75,000 a month. This is the largest payroll in the city. Inroads made by outside coal has occasioned this movement.

KENTUCKY

The Gordon-Miller Coal & Coke Co., in a suit filed, seeks to recover \$1,500 from J. J. Blankenship. The plaintiff, describing itself as a corporation with a capital stock of \$250,000, asserts that on March 10, 1919, Blankenship agreed to purchase 1,500 shares of the stock at \$1 a share; that the stock was delivered to him, and that he sold 200 shares, but has never paid to plaintiff any of the \$1,500 for the stock sold.

An agreed judgment was entered in a Louisville court recently for \$15,000 in favor of the Harlan Coal Co. against the Kentucky Collieries Corporation, the Antonio Coal Co. and the Path Fork Coal Co., jointly. The judgment in the coal case is in full satisfaction for a claim for \$154,200 filed by the Harlan Coal Company for alleged breach of contract.

Fire recently destroyed the storage house and elevator together with hoisting engine and machinery of the Ludlow Coal & Supply Co., at Ludlow. The damage to the building and machinery was estimated at \$12,000.

The Castro Mining Co., Cary, has filed articles with the Secretary of State; capital \$15,000; C. L. Gooch, J. Y. Page and Frank C. Martin are incorporators.

MINNESOTA

The Northern Pacific Ry., in St. Paul, has advertised for bids for coal for two sections of that road—one from Mandan, N. D., to Helena and Butte, Mont., and one from Helena, Mont., to the Pacific Coast. Both sets are being opened today. The first calls for lump coal, from 1,350,000 to 2,400,000 net tons, besides smaller tonnages of washed nut, sizes 2 and 3, and washed pea, sizes 4 and 5, aggregating from 165,000 to 315,000 tons. The second calls for 1,800,000 to 3,000,000 tons.

MISSOURI

One of the largest coal deposits in Missouri has been uncovered at Deepwater and a company will be formed at once to mine it. It is estimated that the field contains 5,000 tons to the acre or 1,000,000 tons in the entire field. The Progress Coal Co. owns the land on which the coal was found.

Suit has been brought by the Home Coal Co. against the City of Macon for recovery of \$4,201.51, alleged to have been collected by the municipal electric light department as an overcharge for electricity in operating the mine for the last four years.

NEW YORK

Under the plan of reorganization authorized by the creditors, the Creditors' Committee of the Interstate Coal & Dock Co. has organized under the laws of Maine a new corporation to be called Interstate Coal & Dock Co. This company will have an authorized capital stock, consisting of 7 per cent cumulative preferred stock, of the par value of \$3,000,000, and 50,000 shares of common stock of no par value. All the property and assets of the old company have been transferred and conveyed to the new corporation, including 9,600 shares of the capital stock of the Low-Volatile Consolidated Coal Co. of West Virginia, which was pledged to certain creditors. Voting trust certificates representing preferred stock in the new company will be issued to creditors having liquidated claims in amounts to be fixed by Special Master Williams, and voting trust certificates representing common stock will be issued both to creditors having liquidated and unliquidated claims and also to stockholders of the old company. Officers of the new corporations are: E. M. Poston, of Columbus, president; William G. Mather, Cleveland, and Charles A. Hirsch, Cincinnati, vice-presidents; C. H. Mead, Beckley, secretary-treasurer and general manager, and F. K. Pendleton, New York City, general counsel.

The Coal Trade Club of New York held a luncheon on March 15 at the Whitehall Club, New York City, the meeting being well attended. The members were addressed by A. F. Corwin of the Metropolitan Trust Co., who spoke on "Credit." F. R. Wadleigh, Chief of the Fuel Division Department, Foreign and Domestic Commerce, Washington, D. C., has promised to give an address at an early meeting of the club.

Robert Hager, president of the Hager Coal Co., Cincinnati and F. U. Fisher, of the same corporation, were visitors to the New York coal market to look over the eastern and shipping situation.

A judgment has been found in Supreme Court at Buffalo against the Fidelity Coal & Coke Co., Pittsburgh, in favor of Harold C. Seitz, Buffalo, for \$27,315.56.

The offices of Whitney & Kemmerer and Dickson & Eddy, at Buffalo are being moved from the Marine Trust Bldg. to the Prudential Bldg.

OHIO

The towboat Helper, one of the Campbell Creek Coal Co.'s fleet, capsized in the Ohio River last week, drowning two people who were on board.

The Brooks Coal & Supply Co., Cleveland, has been chartered with a capital of \$50,000 to deal in coal and supplies. Among the incorporators are T. C. Brooks and W. O. Roehl.

W. E. Darnaby, formerly secretary of the Southeastern Coal Co., is now connected with the Eagle-Elkhorn Coal Co., having been succeeded by Ray O'Connell.

The Wheeling & Cleveland Coal Co., Bridgeport, has been incorporated with capital stock of \$50,000 by M. V. Frazier, A. Dittich, R. J. Bryan, Thomas J. Jordan and David H. James, for the purpose of developing coal properties near Bridgeport.

The W. S. Jennings coal interests of Virginia and Kentucky, will operate a sales office in Cincinnati in charge of W. S. Denham, formerly in charge of Western sales for the Carter Coal Co. The Jennings group of Kentucky mines are in the Hazard district and the sales of some of these are under agreements still to run but will be under the supervision of the new department.

Fred Legg, president of the Logan & Kanawha Coal Co., of Cincinnati, gave a quart of his blood to be transfused in an effort to save the life of his brother Edwin, who had been injured in a railway accident. The effort was unavailing, the victim of the mishap dying a week later.

The Paramount Coal & Coke Co., Cleveland, has been incorporated with a capital of \$25,000 to deal in coal and coke both at wholesale and retail. Incorporators are R. F. Andrie, H. C. Yandt, D. C. Griffith, E. I. Pierson and F. B. Steif.

PENNSYLVANIA

Production in the Fifth Bituminous District, according to a report just completed, fell off in 1921 more than three million tons. The exact figure was 3,525,268 tons. The total for 1920 was 6,610,355 tons. A like drop is shown in the tonnage for the Ninth District, the decrease over 1920 being exactly 3,059,321 tons. Coke production for the two districts also showed a heavy drop, the difference being more than a million tons.

The Westinghouse Electric & Manufacturing Co. has transferred to the Monarch Fuel Co., Latrobe, the coal right on 1,221 acres of land situated along the Bessemer & Lake Erie R.R. The consideration, according to the deed, was \$733,000.

W. F. Sekol, consulting engineer of Scranton, has been engaged by the Northumberland County commissioners to fight the anthracite corporations in an effort to retain an increase in coal assessments in that county. In the past the coal assessment has been \$37,000,000. The county commissioners boosted it to \$93,000,000. The coal companies have announced their intention to fight the increase.

The Continental Insurance Company of New York and the Fidelity Phenix Fire Insurance Company of New York, recently filed a petition with the U. S. District Court, asking leave to withdraw their suit which sought to set aside the sale of the Lehigh & Wilkes-Barre Coal Co. to the Reynolds syndicate. The petition says that the two companies, who based their suit on "information and belief," think the answer filed by the Central Railroad of New Jersey, is correct and that there was no substantial difference between the bids of the Reynolds syndicate and the Franklin Securities Corporation. Since the filing of the answer and examination of the balance sheets, the petitioners think they are not justified in proceeding. This action leaves a similar suit brought by Isaac Starr, a Jersey Central stockholder, pending.

A total of 3,803,073 tons of coal was produced in the Fifteenth Anthracite District in 1921. The number of tons shipped is reported as 3,167,253, while the number of tons sold locally and consumed by employees was 145,921.

A charter has been issued to **W. H. Hughes & Co., Inc.**, Altoona. The purpose of the company is mining, preparing and shipping coal. It has a capital stock of \$300,000 and **E. C. Broomer**, Altoona, is the treasurer of the company.

The commissioners of Dauphin County and the **Philadelphia & Reading Coal & Iron Co.**, have reached an agreement regarding the valuation of the company's lands in East Hanover, Ruch, and Middle Paxton townships. The county's expert recommended that valuation be raised \$900,000, but the agreement was that the old valuation of \$116,905 should be increased by \$50,000. Taxes for 1919-1922 inclusive will be paid on this basis, and a dispute which has lasted for several years is ended. Counsel for the Reading pointed out that their Dauphin County lands do not contain workable coal, as tests had proved the coal to have been crushed badly by the tilting of the rock strata. In Columbia County, the coal lands (Conyngham township and Centralia borough) have been assessed this year at \$22,000,000 an increase of \$20,000,000 over the last valuation.

Production in the **Third and Fifth Anthracite** mine districts during 1921 was nearly 5,000,000 tons, according to the annual reports of inspectors just submitted. In the Third District, 2,845,977 tons were produced, and 2,518,230 shipped to market. A total of 2,056,209 tons was produced in the Fifth District.

There is considerable more activity in the Connellsville coke region. The **Century Coke Co.** has fired 50 additional ovens, making 86 out of 205 now in operation. The **American Coke Corporation** has fired some additional ovens at the Martin plant, making 142 out of 240 ovens at that plant now in operation. The **Republic Iron & Steel Co.** are preparing to start their Martin and Bowwood mines.

Stockholders in the **Lehigh Coal and Navigation Co.** expect to receive a 10 per cent stock dividend within a short time. At a recent meeting in Philadelphia all of the directors who served during the last year were re-elected. The meeting also approved all the policies of **S. D. Warriner**, president of the company.

The Baltimore & Ohio will construct a siding from the Somers and Cambria branch to the new mines of the **Somers-Cambria Coal Mining Co.** just north of Somers. The Somers-Cambria company started to sink a shaft on Jan. 14. A tiple is now being erected.

The **Producer's Coal & Coke Co.**, with offices in Johnstown has opened a branch office in Pittsburgh, which has been placed in charge of **George D. Breck**.

The affairs of the **Grazier Coal & Coke Co.**, one of the oldest corporations of its kind in central Pennsylvania, are in the process of liquidation for the benefit of the stockholders who are the heirs of the late **John A. Grazier** and **H. F. Grazier**. The corporation will be reorganized by **Mrs. Jessie F. Grazier** and **F. J. Gromley**, and will be continued. Mr. Gromley has had many years of experience in the business and at present is the manager of the **Garfield & Proctor Coal Co.** **Miss Frieda Miller** will act in the capacity of treasurer.

Fire broke out recently in the tiple of the **Cokeburg Junction Mine** of the **Acme Coal & Coke Co.**, near Bentleyville, and destroyed about one-third of the structure, causing a loss estimated at \$1,000. The origin is not known.

The newly uniformed special police officers of the **Hudson Coal Co.** made their first appearance a short time ago. The uniform adopted is similar to those worn by the state troopers.

Production fell off over 3,000,000 tons and coke nearly 1,500,000 tons in 1921, as compared with 1920, in the **Ninth Bituminous District**, according to the annual report recently made public. Production in aggregate by tons was:

	1921	1920	Decrease
Coal	2,114,015	5,173,336	3,059,321
Coke	595,325	2,031,133	1,435,808

Production in the **Eleventh Bituminous District** for 1921 was 4,094,901 tons, a falling off of 1,454,225 tons from 1920. The district is entirely in Westmoreland County.

TENNESSEE

The **Mercantile Coal Co.**, with offices at Knoxville and mines at Nick's Creek, at which place it has a lease on 1,200 acres of coal land which carries the Dean seam, has just about completed its new tiple and equipment and will be ready to ship

coal within the next few weeks. This company will have, when completed, one of the most up-to-date operations in the state.

TEXAS

The entire plant of the **Lockney Coal & Grain Co.** was destroyed by fire of unknown origin. The loss will amount to \$25,000 with insurance of \$15,000. Announcement is made that the plant will be rebuilt at once.

Bruce Gentry, of Rockdale, has been re-elected as state mining inspector by the Mining Board in session at Austin.

The **Consumers Lignite & Fuel Co.** has been organized at San Antonio, and has begun operations on an extensive scale in Bastrop County, near Bastrop. This is the twelfth coal mining company to open mines near Bastrop, and coal is now being shipped from that point to all parts of Texas.

The **Galveston Coal Co.** is now bringing coal for bunkers from Mobile to Galveston via barge. The Galveston company heretofore shipped its coal from Virginia on steamers, and it is found that the fuel can be brought much cheaper on barges from Mobile.

UTAH

Frank N. Cameron, vice-president and general manager of the **Liberty Fuel Co.**, Salt Lake City, has been elected to the same office with the **Utah Fuel Co.** Mr. Cameron is one of the best known figures in the coal mining circles of the mountain country. He was the founder of the **Cameron Coal Co.** He will have as his assistant **C. B. Hotchkiss**, former assistant to the president of the **W. P. Railroad**. **L. R. Weber** will succeed Mr. Cameron at the "Liberty."

The **Utah Coal & Coke Co.** has filed its valuation report, showing 2,774.18 acres of coal land in Carbon county worth \$381,634.73.

The **Spring Canyon Coal Co.** reports a valuation in Carbon County of \$656,453. The company has 2,071.3 acres of land.

VIRGINIA

Members of the **Newport News Coal Exchange** are conferring with officials of the exchange relative to adjustment of differences which have arisen over the assessment of demurrage charges. The members claim that the tariffs have been improperly applied, and that there is an irregularity in the manner in which cars have been reported on demurrage. Some shippers claim that the time of arrival of cars has been estimated, rather than checked on actual arrival, and that demurrage charges have been made on this basis. It is said approximately \$100,000 is involved in the controversy.

E. I. Ford, manager of the **Consolidated Pocahontas Coal Co.**, Newport News, has returned from Washington where he had been in conference with railroad officials and with representatives of the **Newport News Coal Exchange**.

W. L. Petty, former head of his own coal business and now a member of the firm of **George W. Taylor & Co.**, coal and ice dealers, has been elected president of the **Lion's Club** of Norfolk, and made governor of this district for the club.

A petition signed by 6,000 Saline County coal miners, asking for the removal of **Thomas English** as State Mine Inspector for that district, has been forwarded to Governor Small. The antagonism against English started in the Harco local and spread to practically every mine in the county.

WEST VIRGINIA

The present plans of the **Consolidation Coal Co.** call for the sinking of additional shafts near Coalwood, operating headquarters for the company in the Pocahontas region. Several hundred additional houses will be constructed. Owing to the growing importance of Coalwood, the Chamber of Commerce of Welch is behind a movement to construct a paved road from Welch to Coalwood.

The **Babcock Coal & Coke Co.** is firing more ovens in Fayette County, there being 60 ovens in all in operation. With additional ovens in blast it has become necessary for the company to produce coal on a larger scale from its **Cliff Top** mines in Fayette County.

Benjamin Blissell of Baltimore, general manager of the **Century Coal Co.** which

operates at Century, was a recent visitor in the Fairmont region.

Walter C. Romine, of Fayette County, must serve a term of six years in the West Virginia penitentiary, having been found guilty of dynamiting and wrecking the power station of the **Willis Branch Coal Co.** on the night of Feb. 15, 1921. Testimony adduced by the state showed that fully 25 men took part in the attack on the power station and that Romine acted as a leader. Several implicated in the disturbances about Willis Branch are now serving terms in the penitentiary. The case will be appealed.

C. H. Jenkins, secretary and treasurer of the **Hutchinson Coal Co.**, has returned to his home at Fairmont after spending a few weeks with Mrs. Jenkins in Florida.

The newly appointed secretary of the **Standard Tide & Inland Coal Sales Co.** is **H. W. Leet**, who has been in charge of the coal department of the **Ashland Coal & Iron Co.**

The **Kingmont plant** of the **Virginia & Pittsburgh Coal Co.** in the Fairmont region is being completely electrified. Power is obtained from the **Monongahela Power & Railway Co.**

The **Davis Colliery Co.** announces that **W. B. Bradford & Co.**, of Philadelphia and New York, have been appointed Eastern sales agents for the company's **Jontee Copen** coal, which is mined near Gilmer, on the Baltimore & Ohio.

Re-election of the old officers and directors of the **Atlantic Smokeless Coal Co.**, of Davis, took place at the annual meeting of this company held a few days ago. General satisfaction was expressed with the showing made by the company as covered in the annual statements and reports. The following officers were re-elected: **George Wolfe**, of Beckley, president, general manager and treasurer; **Dr. J. Howard Anderson**, of Marytown, vice-president; **W. M. Black**, of Lynchburg, Va., secretary.

The **American Coal Co.** announced, following the annual meeting of the company in New York a few days ago, that contracts had been closed for a new tiple to replace the old Crane Creek plant. The new plant will be one of the largest in the Pocahontas field, with a capacity of 400 tons an hour. This company will be one of the first to install an innovation known as the **American Dry Cleaner**. It replaces the washery and cleans coal by holding it in suspension by air instead of by water. A much more thorough preparation of the coal is accomplished, while doing away with the water problem.

Fire completely destroyed the tiple of the **Ashland Coal & Coke Co.** at Ashland, McDowell County. The loss sustained is estimated at \$40,000, said to be fully covered by insurance.

There are several plants in northern West Virginia, it is understood, which recently resumed operations on a non-union basis. One of such plants is known as the **Abbott Mine**, operated by **Byrdon Brothers**, this mine being near Belington in Barbour County. Another report is to the effect that the **Salkeld Coal Co.**, also near Belington, is working on a non-union basis.

Such coal land as underlies the right of way of the **Morgantown & Kingwood Ry.**, operating in Preston and Monongalia counties, has been transferred to the **Penn-Mary Coal Co.**, identified with the **Bethlehem Steel Co.** The **Morgantown & Kingwood** was formerly owned by the **Elkins** estate but was sold to the **Bethlehem** several years ago and is now owned or leased and operated by the **Baltimore & Ohio**.

The **Jamison Coal & Coke Co.**, operating in Pennsylvania and West Virginia has acquired a tract of 728 acres of Pittsburgh coal in Marion County, adjoining the present holdings of the **Bethlehem Mines Corporation**. According to current report, the consideration involved was \$500,000. In the tracts acquired were 443 acres owned by **Phil Sesler**, 134 acres owned by **Jancy J. Trader**, 94 acres owned by **Mary Collier** and 56 acres owned by **Margaret Sesler**. The tract acquired is said to be one of the best tracts of Pittsburgh coal in the field.

W. A. Marshall & Co., of New York, has been appointed as sales agent of the **Soper-Mitchell Coal Co.**, of Morgantown.

R. M. Lambie, chief of the Department of Mines of West Virginia, declares that the number of fatal accidents in the coal mines of the state were greater in February than in any month since last April. Speaking of the number of accidents in the industry last year he states there was one fatality for every 261,000 tons of coal mined. Lack of education is attributed by the mine chief for the increase in fatal accidents.

The Cleveland Cliffs Iron Co. is busily engaged in putting up a new steel tippie at its plant at Ethel in the Logan field. The company expects to have this tippie in operation before long and through the use of such new equipment to materially increase its daily loading capacity.

WASHINGTON, D. C.

In reporting the army appropriation bill the House Committee on appropriations refused the army an appropriation of \$20,000 which had been recommended for the construction of a coal trestle and bin at the Aberdeen, Md., Proving Ground. The bill also limits the army to \$3,000,000 for the purchase of fuel for the coming year.

As an example of the effectiveness of vocational training, the U. S. Veterans' Bureau cites the case of a disabled coal miner who, at the completion of his vocational training, was able to take and successfully hold a position as mine foreman at \$2,100 a year. Before the war, as a coal miner, previous to his disability he received \$1,200 a year.

Both House and Senate have passed a bill to permit agricultural entries on coal lands in Alaska, and it now goes to the President for his approval.

The Navy Department has formally requested the Interior Department to take over the mining of coal at the Chickaloon Mine, at which experiments have been conducted recently. The formal transfer will probably be effected prior to May 1. On the ground that it is a mining function with which the Navy is not concerned, Secretary of the Navy Denby recently advised the House Committee on Appropriations that if it were determined that suitable Navy coal could be obtained in Alaska, that it should be mined by the Interior Department or by private contract. Secretary Denby says that outside of an emergency the use of Alaskan coal for the Navy would be contingent upon delivering coal at Pacific ports at a cost equal to or less than the cost to the Navy of coal near the Atlantic coast. Assuming that the price differential would favor the Alaskan coal he says there are two ways of making it available for Navy use—by arrangement with the Interior Department to mine the coal, stipulating a minimum delivery required under emergency conditions, or to contract with private parties for mining coal under a minimum output delivered to the Navy on demand, and in the absence of Navy use, to be sold in the open market.

Substitution of bituminous coal for anthracite for use at army posts, camps and stations, is being accomplished by the War Department as an economy measure in view of the high prices for anthracite. The Quartermaster General of the Army, in charge of fuel has been forcing the use of bituminous coal everywhere. Representative Anthony, of Kansas, in charge of the army appropriation bill, before the House, commended the army for fuel economy, saying that when anthracite prices go beyond a certain price the use of this coal is extravagant. He made the statement in connection with a report by army authorities that at Fort Riley anthracite stove cost \$20.17 a ton, while bituminous cost only \$7.

The average price paid for bituminous coal at the mines this year by the army has been \$3.32 a ton and \$6.38 delivered, and for anthracite \$9.33 at the mines and \$11.83 delivered, while some few quantities had been purchased as low as \$2.50 and \$2.75 a ton.

Before the U. S. Supreme Court on March 20 re-argument was heard in the appeal of the United Mine Workers of America from the decision of the lower courts which awarded treble damages under the anti-trust law in favor of the Coronado Coal Co., for damages to the coal company's property during a strike in Arkansas several years ago. The union denied that it was a legal entity subject to the suit and fine in its argument. James B. McDonough and H. S. Drinker, Jr., argued the case for the coal company, urging that the lower court award of damages to it be affirmed.

Traffic News

The case of the National Retail Coal Merchants' Association against the Baltimore & Ohio, et al., for resumption of reweighing and re-screening at Tidewater loading points for domestic and anthracite coal, is assigned for hearing on April 7, 10 a.m., at Chamber of Commerce Rooms, Philadelphia, before Examiner H. J. Wagner.

W. W. Houston, of the Panhandle Coal Co., chairman of the committee of twenty-one former shippers through the Lambert's Point Coal Exchange, who petitioned the I. C. C. to investigate the manner in which tariffs regarding demurrage charges were being applied at that exchange, is in Washington attending the hearing on this case. Approximately \$500,000 is involved in the demurrage charges in question. The shippers contended that either the demurrage charges were not being applied properly at the exchange or that the charges were too high. Pending the outcome of the hearing the Norfolk courts were asked for an injunction restraining the Norfolk & Western, operating the exchange, from collecting the demurrage charges due. A further contention is that the charges were placed against the shippers rather than against the exchange.

In the complaint of the Minnesota By-Product Coke Co., the I. C. C. decides that the rates on coke from St. Paul to points in South Dakota, Iowa, Illinois, Wisconsin and Michigan are unreasonable. It prescribes the following rates from June 6: from St. Paul: Mason City and Charles City, Ia., \$2.43; Waterloo and Fort Dodge, Ia., \$2.97; Marshalltown, Cedar Rapids and Des Moines, Ia., \$3.105; Sioux City and Clinton, Ia., \$3.51; Council Bluffs, Ia., \$4.05; Chicago and Moline, Ill., \$3.51. The rates from St. Paul to all points in South Dakota east of the Missouri River are not to exceed rates constructed on the basis of the distance scale of rates on coke in effect from Duluth to the same territory. In the same case the commission holds that the Minnesota intrastate rates on anthracite were not shown to have been an appropriate measure of the rates on coke from St. Paul to Minnesota points during Federal control.

The commission has reopened the case involving reduced rates on coal to Kansas City, Mo., for further oral argument, which will be held at Washington March 30.

In the complaint of the Minnesota Steel Co., an I. C. C. examiner recommends that rates on coal from Missabe Junction to Steelton, Minn., during Federal control were not unreasonable.

Obituary

The body of James E. Lambert, 50 years of age, salesman for the Diamond Coal Co., Hazard, Ky., was brought to his home in Louisville following his sudden death at Rochester, Minn.

Andrew Baile, one of the most prominent coal merchants of Montreal, Canada, died on March 11, after two years illness, at the age of 80 years. He was born in Quebec and came to Montreal in 1869 where he engaged in the coal business. Mr. Baile was active in philanthropic work and was a life governor of the Montreal General Hospital.

William H. Richmond, retired coal operator and philanthropist, of Scranton, Pa., died recently at his winter home in Daytona, Fla.

Association Activities

Northern West Virginia Operators' Association

As the outcome of an exchange of telegrams between the advisory board of the association and C. F. Keeney, president of District 17, United Mine Workers, a meeting of the members and directors of the association was held at Fairmont on March 11 for the purpose of selecting representatives of the operators. It was decided to name the entire scale committee of the association to confer with the representatives of the miners at Baltimore.

Upper Potomac Coal Operators' Association

Directors and officers were elected at the annual meeting of the association held a short time ago in Cumberland, Md. Directors elected were: Truman M. Dodson, Bethlehem, Pa.; James A. Brown, Frostburg, Md.; R. A. Smith, Blaine, W. Va.; Douglas Gorman, Baltimore, Md.; Carroll Pattison, W. E. Ambrose, Cumberland, Md.; J. G. Emmons, Philadelphia; R. Marsh Dean, Elk Garden, W. Va.; A. Spates, Brady, Elkins, W. Va.; S. D. Brady, Fairmont, W. Va. The board chose the follow-

ing officers: T. M. Dodson, president; James A. Brown, vice-president; John F. Palmer, secretary, and R. A. Smith, treasurer.

During the meeting market conditions affecting the industry and wage matters were discussed in an informal way.

At a banquet following the business session, Maxwell C. Byers, president of the Western Maryland, was the guest of honor and principal speaker.

Publications Received

The National Retail Coal Merchants' Association of Philadelphia has issued a booklet entitled *A Simplified Uniform Accounting System for Retail Coal Merchants*.

Annual Report for Year 1920 of State of Alabama, by C. H. Nesbitt, Chief Mine Inspector, Birmingham, Ala. Pp. 90; 6 x 9 in.; tables.

Annual Report of Iowa for the Biennial Period Ending Dec. 31, 1919, by W. E. Holland, R. T. Rhys, Edward Sweeney and L. E. Stamm, State Mine Inspectors. Pp. 48; 6 x 9 in.; tables.

Coming Meetings

American Institute of Electrical Engineers will hold its spring convention at Chicago, Ill., April 19-21. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

National Coal Association will hold its annual meeting at Chicago, May 24 to 26. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham.

Virginia Coal Operators' Association will hold its annual meeting April 15 at Norton, Va. Secretary G. D. Kilgore, Norton, Va.

The fourteenth annual meeting of the International Railway Fuel Association will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the Illinois and Wisconsin Retail Coal Dealers' Association will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Chicago Coal Merchants' Association will hold its annual meeting April 11 at Chicago, Ill. Secretary, N. H. Kendall, Plymouth Building, Chicago, Ill.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.

The readiness of many Midwestern miners to strike was evidenced last week when the men in one mine protested against a certain state mine inspector because that official did not compel the company to maintain the workings as they should be. For one thing entries were not cleared fast enough. The company president visited the place. He offered his men a chance to do the clearing and they refused. He gave them three days. They did nothing. Then, believing the whole ruction was only an effort to get the inspector into difficulty, he closed the mine indefinitely.